Minnesota Pollution Control Agency

TONI VOLKMEIER
AQ/PS

INTEROFFICE

October 10, 1995

TO INTERESTED PARTIES

Enclosed is the Environmental Assessment Worksheet (EAW) for the proposal by American Iron and Supply Co. to construct and operate a Kondirator metal shredder. The EAW was prepared by the Minnesota Pollution Control Agency (MPCA) and is being distributed for a 30-day review and comment period pursuant to the Environmental Quality Board rules. The results of human health and ecological risk assessments for the project are summarized in the EAW. The comment period will begin on October 11, 1995, and end on November 15, 1995.

Comments received on the EAW will be used by the MPCA in evaluating the potential for significant environmental effects from this project and deciding on the need for an Environmental Impact Statement.

The MPCA will hold a public informational meeting on the proposal's EAW and risk assessments on Monday, October 16, 1995. The meeting will begin at 6:30 p.m. in the gymnasium of the Logan Park Community Center on Monroe and Broadway Streets in northeast Minneapolis. At this meeting, the MPCA will provide information about the project, explain the environmental review and risk assessments, and answer questions about the project.

If you have any questions on the EAW, please contact William J. Lynott of my staff at 612/296-7794.

Sincerely,

Craig Affeldt

for Paul Hoff, Director
Environmental Planning and Review Office
Administrative Services Division

PH:pnk

Enclosure

ENVIRONMENTAL ASSESSMENT WORKSHEET (EAW)

NOTE TO REVIEWERS Comments must be submitted to the Minnesota Pollution Control Agency (MPCA), the Responsible Governmental Unit (RGU), during the 30-day comment period following notice of the EAW in the Minnesota Environmental Quality Board (EQB) Monitor. (Contact the MPCA or the EQB to learn when the comment period ends.) Comments should address the *accuracy and completeness of the information, potential impacts that may warrant further* investigation, and the need for an Environmental Impact Statement (EIS).

1. **Project Title** American Iron & Supply Metal Recycling Mill (Kondirator) Installation Project

2. **Proposer** American Iron & Steel Corporation d/b/a American Iron & Supply Company

   Contact Person Walter H. Rockenstein II

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   200 Norwest Center, 90 South Seventh Street

   Minneapolis, Minnesota 55402-3901

   Phone (612) 336-3000

3. **RGU** MN Pollution Control Agency

   Contact Person William J. Lynott

   and Title Project Manager

   Address 520 Lafayette Road

   St. Paul, Minnesota 55155-4194

   Phone (612) 296-7794

4. **Reason for EAW Preparation**

   ____ **EIS Scoping**   _X_ **Mandatory EAW**   ____ **Citizen Petition**
   ____ **RGU Discretion**   ____ **Proposer Volunteered**

   If EAW or EIS is mandatory give EQB rule category number(s).

   Minnesota Laws 1994, Chap. 639, Sec. 2. This statute directed MPCA to prepare an EAW and risk assessment on the project. There is no mandatory category for environmental review of such projects in the EQB rules.

5. **Project Location**

   Blocks 16, 17, 18, 19, 31, and 32, Morrisons Addition to Minneapolis including vacated streets.

   County Hennepin **City/Twp** Minneapolis

   The following are attached to the EAW:

   Figure 1. a county map;
   Figure 2. a USGS map;
   Figure 3. Kondirator facility layout;
   Figure 4. VIC cleanup monitoring well location;
   Figure 5. Kondirator process flow diagram;
   Figure 6. view west from Mississippi River;
   Figure 7. noise sensitive land user; and
   Figure 8. noise control measurer.

6. **Description Give a complete description of the proposed project and ancillary. Emphasize construction and operation methods and features that will cause physical manipulation of the environment or produce wastes. Indicate the timing and duration of construction activities.**

The project description is presented in the following sections:

A. Summary
B. Equipment To Be Installed
C. Proposed Raw Materials
D. Metal Shredding Process Description
E. Hours Of Operation
F. Yearly And Monthly Throughput
G. Material Handling
H. Employment
I. Transportation
J. Construction Schedule

A. SUMMARY

AIS proposes to construct and operate a metal shredding machine called a Kondirator at its existing scrapyard site in Minneapolis.

AIS is a metal recycling firm which has operated from its existing yard at 2800 Pacific Street North in Minneapolis since 1951. AIS's facility includes 12 acres of property and eight buildings: office with truck scale; red metal[1] recycling building; crane maintenance building; old baler; metal shear; aluminum recycling building; and two storage buildings (collectively the AIS property). Next to the aluminum recycling building is an impervious area for the outdoor storage of aluminum scrap and an oil/coolant containment facility.

AIS intends to install a metal shredding machine to increase its capacity to recycle metals and to improve quality by producing a higher grade of ferrous scrap for the recycled metals market. This machine is to be constructed on about 3.6 acres of land adjacent to the Mississippi River (the project site).

A metal shredding machine reduces the size of scrap metal fed into the machine by shredding it into smaller pieces. In addition to reducing the size of scrap metal, the machine chosen by AIS removes dirt and other non-metallic materials from the shredded metal and separates ferrous metals from nonferrous metals. The resulting products will be: (1) clean ferrous metal scrap of relatively uniform size suitable for recycling by steel mills; and (2) various nonferrous metals of relatively uniform size suitable for recycling.

The following sections detail the specific equipment proposed for installation, proposed raw materials, the metal shredding process, hours of operation, monthly throughput, how materials will be handled, transportation, employment, and the construction schedule.

[1]Red metal means metal containing copper.

B. RISK ASSESSMENT

Pursuant to special legislation pertaining to this project, human health and ecological risk assessments have been prepared for this project. To reduce bulk copying costs these documents are not appended to this EAW, but are available at the MPCA for review upon request. The risk assessments are fully summarized in item 31 of this EAW.

The specific machine to be installed consists of three major parts - the shredding machine, cleaning and separating equipment, and the air pollution control equipment. The shredding machine will be manufactured by Lindemann Maschinenfabrik GmbH (Lindemann) and is sold under the trademarked name "Kondirator." AIS chose the Kondirator over competing metal shredding machines because it: (1) can handle oversize metal scrap without jamming; (2) can process denser scrap, i.e., thicker gauge metals, than other machines; (3) uses lower horsepower to achieve the same throughput as other machines; (4) is designed for rapid repair; and (5) is isolated from its foundation by heavy springs to eliminate transmission of vibration.

The cleaning equipment, ferrous/nonferrous separation equipment, and the air pollution control equipment will be supplied by an air pollution control equipment vendor.

The Kondirator is a very large machine, having the capacity to shred up to 100 tons of metal scrap per hour, but it is medium-sized machine as compared with equipment currently available for purchase and already installed in the United States. Metal shredders can be purchased today with maximum capacities ranging from six to 300 tons per hour.

More than 200 metal shredders have been installed in the United States, ranging in capacity from six to 250 tons per hour. Most were designed to handle automobile hulks. Autos are made with relatively thin gauge metal. The Kondirator's capacity to handle heavier gauge material with lower horsepower is the most significant difference between it and other shredders currently operating in the United States.

C. PROPOSED RAW MATERIALS

The Kondirator will process the following raw materials: heavy melting steel, new production sheet metal in the form of clips and No. 1 bundles, old sheet metal, old sheet metal in the form of No. 2 and No. 3 bundles, and cast iron. The following paragraphs describe these materials in more detail and delineate materials which will not be processed by the Kondirator. Raw material feedstock estimates included in these paragraphs were prepared for AIS by Charles River Associates, of Boston, Massachusetts, a leading independent expert on the scrap metal industry.

1. **Heavy Melting Steel.** Heavy melting steel is steel at least 1/8 inch thick and encompasses various categories of both uncoated[2] new scrap steel[3] and previously used scrap steel,[4] including auto parts, bar crops, bundled steel, cast steel, electric furnace bundles, foundry steel, plate scrap, punchings, steel from dismantled railroad cars, and structural steel. Some of the obsolete steel will be coated. Major sources of this material are automotive recyclers,[5]

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[2]Uncoated material is referred to as "black" material in the scrap metal recycling industry.
[3]New material is referred to as "prompt" in the industry because it is generated daily by manufacturers.
[4]Previously used material is referred to as "obsolete" in the industry.
[5]Automotive recyclers, also called auto salvagers, take whole cars, salvage useable parts for resale, recycle some nonreuseable parts through scrap metal dealers, and then either crush the hulk or sell it whole to another recycler or to a steel

demolition contractors, farms, the general public, metal fabricators, metal stampers, original equipment manufacturers, and other scrap recyclers. AIS estimates that heavy melting steel will constitute approximately 50 percent of the raw materials for the Kondirator.

2. **New Production Sheet Metal.** New production sheet metal will be received as clips and No. 1 bundles. Clips are uncoated sheet metal scraps generated daily in various businesses. Major sources of this material are steel service centers and original equipment manufacturers such as metal stampers. According to the Institute of Scrap Recycling Industries, Inc.'s *Scrap Specifications Circular 1993 - Guidelines for Ferrous Scrap, Nonferrous Scrap, Paper Stock, and Plastic Stock*, clips "may not include old auto body and fender stock" and must be "free of metal coated, limed, vitreous enameled, and electrical sheet containing over 0.5 percent silicon." No. 1 Bundles (or #1DB) are clips compressed or hand bundled to charging box[6] size and weighing not less than 75 pounds per cubic foot. AIS estimates that clips and a limited number of No. 1 bundles will constitute approximately 36 percent of the raw materials for the Kondirator.

3. **Old Sheet Metal.** Old sheet metal is obsolete sheet steel including appliances. It may be uncoated or be coated with various coatings including vitreous enamel. Major sources of this material are appliance recyclers, automotive recyclers, building contractors, demolition contractors, farms, the general public, and other scrap recyclers. Appliances can be accepted only from certified vendors who must remove all capacitors, chlorofluorocarbons, and mercury switches before delivering the appliances. AIS estimates that sheet iron will constitute 13 percent of the raw materials for the Kondirator.

4. **No. 2 And No. 3 Bundles.** No. 2 and No. 3 bundles (or #2DB and #3DB) are old sheet metal compressed to charging box size and weighing not less than 75 pounds per cubic foot. According to the *Scrap Specifications Circular 1993*, No. 2 bundles may include galvanized steel but cannot include tin or lead-coated material or vitreous enameled material. No. 3 bundles may include all coated scrap not suitable for inclusion in No. 2 bundles. Sources for this material are appliance recyclers, automotive recyclers, and scrap recyclers. AIS estimates that No. 2 and No. 3 bundles will constitute less than one percent of the raw material for the Kondirator.

5. **Cast Iron.** Cast iron is obsolete cast iron. Sources for this material are automotive recyclers, farms, the general public, and other scrap recyclers. Automotive recyclers will supply cast iron parts, not auto hulks. AIS estimates that cast iron will constitute less than one percent of the raw materials for the Kondirator.

6. **Materials That Will Not Be Processed.** The Kondirator will *not* process any automobile hulks, closed containers, vehicle engines with oil pans and filters still attached, metal turnings, or any other raw products that may contain liquids such as waste oils. AIS uses a proactive pollution prevention program to minimize the delivery of liquids to AIS. Metal scrap with liquids is handled separately at the used oil/coolant containment facility. Consequently, the raw materials to be processed by the Kondirator will contain no more than

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mill. AIS does not purchase whole or crushed auto hulks. AIS does purchase car parts such as whole motors (with oil pans and filters removed), radiators (drained), hoods, gas tanks (punctured with large holes), tire rims, and brake drums. These parts are metallic and do not create a waste residue such as that associated with the shredding of auto hulks.

[6]Charging box refers to the large container which feeds the melting furnace in a mill. Scrap metal must be sized to fit inside such containers, so the scrap can be fed into the furnace.

trace amounts of liquid materials. (For a detailed description of AIS's pollution prevention program, including specific efforts to prevent and deal with hydrocarbon contamination, see the answer to Question 20.F.).

7. **Coatings.** The vast majority of coated materials handled by AIS are home appliances, otherwise known as white goods. Several Material Safety Data Sheets (MSDSs) for appliance coatings were reviewed to find the composition of the appliance coatings. Many MSDSs listed only the hazardous ingredients, which consisted of volatile organic compounds. These compounds are in the coating as it is applied to the appliance during manufacturing, but they evaporate during the drying of the coating, leaving the solid constituents. It is the solid constituents that will remain on the appliance and be present when the appliance is shredded.

   MSDSs typically listed titanium dioxide, a nonhazardous solid, and talc as solid compounds in appliance coats. The boiling point range of titanium dioxide is 2,500 to 3,000 degrees Celsius, which is a temperature range considerably higher than would likely be attained in the Kondirator shredding operation. Thus, the only significant mode of release into the atmosphere for the appliance coatings would be chipping of coatings during the shredding, with coating chips becoming airborne as particulate matter. Such particulate matter would be mostly captured by the Kondirator Dust Collection System. Other types of coatings are infrequently encountered.

   Several MSDSs were reviewed which described coatings that could occur on metals other than appliances. Many of the MSDSs list volatile organic hazardous components; however, again, these volatile components would evaporate during the manufacturing process.

   Based on this information, air emissions from coating volatilization issues are not deemed significant.

D. METAL SHREDDING PROCESS DESCRIPTION

The metal shredding process using the Kondirator consists of several sequential unit operations: feeding, fragmenting, cleaning, size separating, magnetic sorting, and discharging.

1. **Feeding.** Raw materials are placed on the infeed steel belt conveyor by a grapple or magnetic crane. Material is discharged from the steel belt conveyor to a 98-inch wide feeding chute. A pressing lid compresses the feed to a 38-inch height. The feed will be further flattened by a pair of hydraulic feed rollers. Normal operation will allow the use of low pressure between the feed rollers, but the pressure will be adjustable to allow for processing highly resilient feed such as agricultural machine scrap or scrap bales. The spacing between the feed rollers can also be adjusted to accommodate scrap feed of different thicknesses.

   Automatic controls on the rotation of the feed rollers will control the linear speed of the feed to the Kondirator. This will maintain a constant load on the main motor and prevent jamming of the machine.

A control cabin houses the main controls for the Kondirator as well as a telephone for emergency communication. The control cabin is located near the feeding chute and has a line of sight to the feeding area. The front window is armor plate glass; the sides will have safety glass. (The size of the cabin is eight feet by eight feet by eight feet.)

2. **Fragmenting.** The next step after feeding is fragmenting. This is the primary function of the Kondirator. In this step, the feed is seized between hammers on a rotating shaft and a stationary anvil; this develops a shredding action that reduces the size of the feed material. Pieces that are small enough will pass through the size-controlling ejection grate and fall to a conveyor that transports the product to downstream processing. Pieces that are not small enough remain in the hammer beating circle and continue to be impacted to produce smaller pieces. Occasionally pieces will be encountered that cannot be effectively size reduced. These pieces can be removed by swinging the hinged ejection grate.

   The fragmenting operation will generate particulate emissions. These particulates will be collected and subjected to a two stage separation process. The particle collection process will consist of drawing 40,000 cubic feet per minute (cfm) of air through the shredder housing. Based on the dimensions of the housing, this suction will maintain a negative pressure in the housing and a minimum face velocity of 728 feet per minute at all openings. The air velocity passing the product as it exits the discharge chute will also clean the product of adhered dust. The separation process is called the Kondirator Dust Collection System and is discussed below in the section on air pollution controls.

3. **Size Separating.** As mentioned above, product that has passed through the fragmenting step will fall to a conveyor. A vibrating conveyor will pass the product to a belt conveyor that transports the product to a separation and removal system called the long/short separation station. At this station, the cleaned long pieces will be removed and deposited on a stockpile for further processing. The remaining pieces will advance to the sieving drum.

   The sieving drum is nine feet in diameter and 18 feet long. It will separate oversize material from the shredded product. The oversize pieces are conveyed back to the Kondirator fragmenting step if they are shreddable, and unshreddable oversize pieces drop through an ejection flap to be handled manually. The screening track contains interchangeable screens for sorting materials of various sizes up to six inches in diameter. Shredded product falls into a collection funnel located beneath the screening track, and into a drop chute located beneath the collection funnel. In the drop chute, approximately 8,800 cfm of air drawn through the product as it drops through the chute partially cleans the product of adhered dust. The product is then conveyed to an air classifier.

4. **Cleaning.** The air classifier performs a final cleaning of the product. In the classifier, dirt and other contaminants are removed from the product by a zig-zag sifter approximately 60 inches wide and 102 inches high. As the product moves down through the sifter, approximately 80,000 cfm of air is drawn up through the product opposite to the direction of product flow. This air stream separates lightweight particles from the ferrous and nonferrous metals and non-metals. Raw dust and waste laden air will then be drawn into and processed in the Cascade Cleaning System, discussed below in the section on air pollution controls.

5. **Magnetic And Manual Separation.** Cleaned product is next conveyed to the magnetic separation station. Here, the magnetic fraction (ferrous metals) will be lifted by a magnet from the non-magnetic fraction (nonferrous metals and non-metals) and deposited onto a

sorting belt conveyor. This conveyor will advance the magnetic fraction of the product to a manual sorting station. At this station, the pieces that were lifted by the magnet but that contain a large fraction of nonferrous components will be removed by hand. The non-magnetic fraction will advance by conveyor to the nonferrous metal sorting station. At this station, the nonferrous metals will be removed by hand. The remaining non-metals will drop into containers for disposal.

6. **Product Discharge And Loading.** The ferrous product will be transferred to a discharge conveyor. The conveyor will be on a motorized swing track with a swivel. This configuration will allow the conveyor to deposit finished product directly onto rail cars, barges, or the product storage area. The company anticipates (but has not yet finally decided on) using a downward-sloping barge loading conveyor to transfer the ferrous product from the discharge conveyor into the barges. This conveying system will be designed to minimize finished product freefall, thus minimizing noise and dust generation. Barges and rail cars will also be loaded from the product storage pile by grapple and magnetic cranes.

7. **Minimizing Fugitive Emissions From The Process.** All shredding, sorting, and transporting operations within the machine will be enclosed to minimize particulate emissions. All conveyors will be covered. The fragmenting operation will be shrouded to enable the air stream to maximally entrain the dust generated in the process.

   According to the company, there are no magnetic forces within the Kondirator that would bind particulate matter to the ferrous products. The fragmenting portion of the Kondirator is a hammer mill shredder, which is a mechanical shredding device. Therefore, only mechanical forces are encountered by the metals being shredded.

   The only magnetic forces that would be encountered by the throughput materials would be the magnetic separator, which is located after the Kondirator Dust Collection System and the Cascade Cleaning System. Because of its location, this magnetic separator would not generate a significant magnetic force or affect the removal of particulates by the Kondirator Dust Collection System or the Cascade Cleaning System, according to AIS.

8. **Additional Air Pollution Control.** Because the risk assessments (summarized in item 31) found that some potential risks from the project exceed established risk thresholds, AIS has proposed the use of a fabric filter to further reduce emissions from the Kondirator. The MPCA has analyzed this proposal and concludes that this equipment would minimize, but not completely eliminate, the potential risk from the project. The analysis is available from review at the MPCA on request.

E. HOURS OF OPERATION

The hours of operation for the Kondirator are specified in Special Council Permit No. 62483 issued by the city of Minneapolis on June 11, 1990, which is the subject of litigation between the city and the company. The hours are as follows:

Monday - Friday	7:00 a.m. to 6:00 p.m.
Saturday, Sunday and Legal Holidays	9:00 a.m. to 6:00 p.m.

Assuming nine legal holidays which do not overlap with any Saturday or Sunday, the total operating hours per year will be 3,778 hours. A limit on operating hours will also be a condition of the MPCA Air Emission permit.

AIS will be open to receive materials from 7:00 a.m. to 4:00 p.m. Monday through Friday. This does *not* constitute a change from its current hours for receiving materials.

F. YEARLY AND MONTHLY THROUGHPUT

Given 3,778 operating hours per year and a maximum capacity of 100 tons per hour, the yearly input of raw materials by the Kondirator would be 377,800 tons, or 31,484 tons per month.[7]

The expected yield is estimated to be 30,597 tons per month of ferrous and nonferrous product.

G. MATERIAL HANDLING

1. **Raw Materials.** Raw materials will be unloaded and fed using a single, mobile, magnetic or grapple crane. The process feed area has been designed to enable the crane to unload either from trucks or rail cars and to deposit to either the raw materials storage area or directly to the feed conveyor on the Kondirator. The raw materials will be stored in an area approximately 110 feet by 140 feet with a stackable height of approximately 25 feet. This provides a total raw materials storage area of approximately 15,400 square feet. This storage area has been sized to accommodate the fluctuations in raw material supply which AIS has experienced in the past. Assuming a production rate of 100 tons per hour, and a raw material density of 250 pounds per cubic foot due to large pieces and void spaces, the raw material storage area will hold enough material for four to five days of Kondirator operation. No off-site storage of raw materials swill be required.

   The raw materials will be fed to the Kondirator on a belt conveyor with a usable width of 96 inches, a maximum length of 114 feet, a variable speed to 37 feet/minute, and a weight capacity of 200 tons per hour.

2. **Finished Product.** The ferrous finished products of the Kondirator can be loaded directly onto barges, loaded directly onto rail cars, or deposited to the product storage area by a belt conveyor. The product discharge conveyor is 48 inches wide, 65 feet long, and has a 25 horsepower belt drive. The conveyor is on a motorized swing track with a swivel to allow the point of deposit to be repositioned along a 180-degree arc.

   At the western end of the arc, the conveyor can deposit finished product into open top gondola rail cars. At the eastern end of the arc, finished product can be transferred onto an adjustable barge loading conveyor. The adjustable conveyor would minimize the freefall of

[7]This estimate assumes that the Kondirator will process the maximum input every hour of operation, an assumption required for air emission permitting. In reality, maintaining maximum throughput every operating hour would be impossible. Variations in feed rates and raw materials, normal maintenance, and breakdowns will reduce the throughput. Estimates prepared for the litigation between AIS and the city of Minneapolis projected an average throughput of 85 tons per hour. Nevertheless, the assumption of 100 tons per hour is used throughout this EAW for evaluating all potential environmental impacts.

finished product into the barge, reducing noise and more evenly filling the bottom of the barge. An apron between the barge and shore will minimize accidental discharge of finished product into the Mississippi River.

Finished product may also be loaded onto rail cars and barges by grapple or magnetic cranes.

The finished product storage area is 40 feet wide and is located along the arc between the rail and barge loading points. The area available for finished product storage is approximately 11,310 square feet. The maximum height of material stored on the finished product storage area will be approximately 24 feet. This storage area has been sized to allow for the frequent shortages of barges and rails cars that AIS has experienced. At a production rate of 100 tons per hour, and assuming a finished product density of 500 pounds per cubic foot, the finished product storage area would store six days of production. No provisions for off-site storage of finished product will be required.

The barge staging area on the river can accommodate two barges. Barges will be delivered (if available) and removed on request by either Dakota Barge, Inc. or River Services, Inc.

3. **Process Wastes.** Shredding process wastes consisting of plastic, wood, dirt, paper, and other waste materials will be handled at the collection points of the pollution control equipment and at the manual sorting stations. The pollution control equipment will deposit collected wastes directly into covered shipping containers. This will minimize fugitive emissions and eliminate the need for additional handling steps. The wastes collected at the manual sorting stations will also be deposited directly into shipping containers. The shipping containers will have a capacity of approximately 40 cubic yards and will be stored on-site at their point of collection until the waste capacity has been reached. At this time, the wastes will be disposed of by incineration or landfill.

4. **Minimizing Fugitive Emissions From Material Handling.** Roadways and other impervious areas outside and inside the AIS property will be swept and watered as necessary to control dust. As noted above, pollution control equipment will deposit collected wastes directly in covered shipping containers, and wastes from the manual sorting stations will also be deposited directly into shipping containers as well.

H. EMPLOYMENT

AIS currently employs 45 persons. It is estimated that 20 employees will be added as a result of the Kondirator installation. AIS expects that on weekdays, ten persons will work the 7:00 a.m. to 4:00 p.m. shift, five persons will work from 7:30 a.m. to 5:00 p.m., and five persons will work from 1:00 p.m. to 10:00 p.m. (Employees will work after the Kondirator ceases operation to perform maintenance and other related tasks.)

I. TRANSPORTATION

Most of the raw materials will arrive at AIS's yard by truck and rail. During the spring, fall, and summer, finished product will be shipped by rail and barge. During the winter when the Mississippi River is frozen, finished product will be shipped by rail. AIS estimates that 40-50 percent of the finished product will be shipped by barge and 50-60 percent by rail.

J. CONSTRUCTION SCHEDULE

AIS intends to commence site preparation in early spring of 1996. Initial construction will include project site grading, development of the drainage detention area, and installation of foundations and underground site utilities (water, electricity, and communications). Support steel and the metal shredding equipment will be installed after completion of foundations. The building housing electrical and mechanical equipment, with the control cubicle on top, will be constructed during this period. Installation of electrical and mechanical systems will follow. Start up and check out activities will begin upon substantial completion of the equipment installation, culminating in commercial operation of the facility.

7. Project Magnitude Data

Total Project Area (acres)	3.6 acres	or Length (miles)	
Number of Residential Units			
Unattached	0	Attached	0
Commercial / Industrial / Institutional Building Area (gross floor space)			
Total	2,769[8]	square feet;	
Indicate area of specific uses:			
Office	0	Manufacturing	0
Retail	0	Other Industrial	2,769
Warehouse	0	Institutional	0
Light Industrial	0	Agricultural	0
Other Commercial (specify)	0		
Building Height(s)	72 feet to top of light stanchion on highest part of the machinery		

8. Permits and Approvals Required (List all known local, state, and federal permits, approvals, and funding required:)

Unit of Government	Type of Application	Status
City of Minneapolis	Variance from height restriction in shoreline district	In litigation[9]
	Conditional Use permit for scrap/salvage yard, metal milling facility	In litigation[10]
	Building permit(s)	To be applied for

[8]Approximate area covered by the footprint of the machine including air pollution control equipment and sorting stations.

[9]AIS has brought a legal action against the city of Minneapolis claiming that the issuance of Special Council Permit No. 62483 on June 11, 1990, gave AIS the right to install the Kondirator without further city permits, except building permits. The city claims that AIS must secure a variance from the shoreland height restriction in Minneapolis Code of Ordinances, Title 20 - Zoning Code, § 560.80. If AIS prevails, no variance will be necessary. If the city prevails, AIS will pursue a variance.

[10]Subsequent to the city issuing Special Council Permit No. 62483, the City Council amended the Minneapolis Code of Ordinances, Title 20 - Zoning Code, Article IV - M3 General Manufacturing District to require a conditional use permit for the installation of metal milling machines in the M3 Districts. As part of its legal action against the city, AIS claims that because it secured Special Council Permit No. 62483 prior to this amendment, AIS has the right to install the Kondirator without securing a conditional use permit. The city claims AIS must secure a conditional use permit. If AIS prevails, it will install the Kondirator without a conditional use permit. If the city prevails, AIS will pursue a conditional use permit.

MPCA	Air Emission permit *	Application being prepared for submission
	National Pollutant Discharge Elimination System (NPDES) General permit authorizing industrial storm water discharge[11]	To be amended if necessary
	NPDES General Construction permit	To be applied for

Note: There will be no discharge of industrial wastewater to the sanitary sewer. Therefore, no permit is required from Metropolitan Council Wastewater Services (formerly the Metropolitan Waste Control Commission.)

* This facility will need to obtain a state air emission permit from the MPCA before it is constructed. Minn. R. pt. 7007.0250. A question may arise, however, as to which type of state air emission permit the facility should seek -- an individual state permit or a registration permit. For the sake of clarity, we answer that question here.

  First, it may be helpful to explain the differences between an individual state permit and a registration permit. Individual state permits are subject to the public notice and comment requirements provided in Minn. R. pt. 7007.0850 - pt. 7007.0950. Individual state permits can be tailored to the facility being permitted, and therefore can contain individual conditions needed to protect the environment. In contrast, registration permits are permits-by rule. They do not require public notice and comment because they simply refer to the terms and conditions already established by rule in Minn. R. pt. 7007.1110 - 7007.1130. See Minn. R. pt. 7007.1110, subps. 6 and 7. If the MPCA believes those terms need to be varied to protect the environment, it must deny an application for a registration permit and issue an individual state permit. See Minn. R. pt. 7007.1110, subp. 5 and pt. 7007.1000, subp. 2.

  Second, in issuing any permit for a facility, the MPCA needs to consider whether its operation will materially adversely affect the environment and, if it will, whether there are feasible and prudent alternatives, including more restrictive permit terms. Minn. Stat. § 116D.04, subd. 6. Thus, before the MPCA can issue a registration permit for a facility, it must be able to conclude, that, *at the operating terms set out in the registration permit rule,* the facility will not materially adversely affect the environment or has no feasible and prudent alternatives to mitigate a material adverse effect.

  Minn. R. pt. 7007.1130, subp. 5 establishes the emission limits to be included in a registration permit for the Kondirator. Based on this rule, a registration permit for the Kondirator would have to include a particulate emission limit of 50 tons/year based on a 12-month rolling average. But this EAW for the Kondirator does not analyze the environmental effects of operating the facility at a 50 tons/year particulate emission limit. Rather, the EAW considers a more restrictive particulate limit based on assumptions about potential health issues associated with particulates from the facility. *Thus, as it is now drafted, this EAW does not contain information that would allow the MPCA to conclude that, at the thresholds*

[11] AIS obtained this permit in 1992. Its full designation is *General Permit Authorization To Discharge Storm Water Associated With Industrial Activity Under The National Pollutant Discharge Elimination System/State Disposal System Permit Program,* Permit No. MN G610000, September 30, 1992 ("NPDES General Permit No. MN G610000").

established in the registration permit rule (50 tons/year), the facility is not likely to materially adversely affect the environment. The facility therefore cannot obtain a registration permit from the MPCA as this EAW is now drafted. It may, however, be able to obtain a registration permit if (1) this EAW is amended to analyze environmental affects at the 50 tons/year limit and (2) the effects at the 50 tons/year limit are found not to materially adversely affect the environment.

In short, if the MPCA decides to issue a Negative Declaration requiring no further environmental review for this facility, there is not sufficient information in the EAW to justify issuance of a registration permit for the facility. If a Negative Declaration is issued and the facility wishes to seek an air emission permit from the MPCA, it will have to apply for an individual state permit that will include any mitigative measures found needed by the MPCA based on this EAW or other information before it.

9. Land Use Describe current and recent past land use and development on the site and on adjacent lands. Discuss the compatibility of the project with adjacent and nearby land uses; indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazard due to past land uses, such as soil contamination or abandoned storage tanks.

The land use description is presented in the following sections:

A. Summary
B. Past Land Use
C. Present Land Use
D. MPCA Voluntary Investigation and Clean-Up (VIC) Program Participation
E. Soil Chemistry Results
F. Removal Of Underground Storage Tanks

A. SUMMARY

The AIS property is located on the west bank of the Mississippi River in an area designated by the city as the North Washington Industrial Park. See Question 28.B. for a full discussion of the North Washington Industrial Park. Surrounding land uses are of a heavy industrial nature with open storage, noise, and heavy truck traffic prevalent throughout the district. The AIS property is compatible with these surrounding uses.

AIS is participating in the MPCA VIC program. Results to date show that while soil contamination exceeds MPCA action levels, a successful interim response action would allow installation of the Kondirator to proceed. Ground water testing shows that ground water has not been impacted by AIS's business operations. Additional ground water testing will be required. AIS has removed all unused underground storage tanks on its property.

B. PAST LAND USE

Historical land uses at and around the AIS property were evaluated from air photographs (1938 to 1993), Minneapolis City Directories (1910 through 1990), and Sandborn Fire Insurance Maps (1889, 1912, 1950, and 1967) as part of a Phase I Audit, performed under the MPCA VIC Program and submitted to the MPCA in March 1992 and as part of preparing this EAW. These resources are on file at MPCA and are available for review on request.

In the late 1800s, this area along the river was almost completely developed with lumber yards and saw mills. At this time, the AIS property and its surroundings were the site of lumber storage areas. By the turn of the century, much of the lumber businesses had closed or moved elsewhere and the area was essentially vacant.

The 1938 aerial photo shows that this area was essentially vacant at that time and may have been used for agricultural purposes. An industrial use was in place at Pacific and Lowry, however. A 1947 aerial shows essentially the same uses with a small commercial or industrial use on the river at 28th Street North. The AIS property appears to have been under cultivation and/or used for the storage of vegetables (presumably in association with the H.A. Gedney Pickling Company, located immediately north of the site during this time period). Three to four buildings or sheds on the southern part of the site were noted in the air photos.

By the 1950s the district was beginning to be developed into an industrial area with manufacturing plants, scrap yards, and other industries locating in the area to take advantage of the Mississippi River, railroad, and Washington Avenue.

AIS purchased the south end of the property in the late 1940s and metal scrap recycling operations started in 1951. In 1952, the current main building at the site was constructed. The 1953 Minneapolis City Directory lists "American Iron & Supply Salvage" under the 2800 Pacific Street North listing. The rest of the AIS property was purchased at a later date.

By this time the entire area east of Washington Avenue and south of the Lowry Avenue Bridge had developed into the industrial district that exists today, as is confirmed by the 1967 aerial of the area. See Attachment 3 - 1967 Aerial.

The area across the river from the AIS property has been a mix of residential, commercial, and industrial uses with residential locating in the small area between 23rd and roughly 20th Avenue Northeast. The 1938 aerial shows that much of the east side of the riverbank was residential with a couple of commercial and industrial uses. By 1947 the east riverbank was experiencing a turnover from residential to commercial and industrial uses. The 1967 aerial shows that much of the residential had moved out of the area except for the pocket of homes around the 22nd Street intersection. Much of the commercial and industrial uses had relocated as well, leaving areas of open space and vacant land.

C. PRESENT LAND USE

Since 1951, AIS has operated a scrap metal recycling facility on some or all of the AIS property. Historical and recent stockpile and storage areas for various scrap metals are described in the MPCA VIC Program Phase II Work Plan for the soil and ground water investigation.

Today, the AIS property is located within an established industrial district, surrounded by other heavy industrial uses. The area is home to manufacturers, metal recyclers, the city's solid waste transfer station, and a stone works. Cranes, conveyor belts, electrical transmission lines, open storage, storage piles, heavy trucks, loud noises, and odors dominate the area. The entire area is zoned M-3, the city's heaviest industrial use.

The Hennepin County list of hazardous waste generators, transporters, and disposers indicates that there are 47 licensed generators, transporters, or disposers of hazardous waste within a one mile radius of the site (as of December 11, 1992). At least 21 of these are within three blocks of the AIS property.

The AIS property is located above the Mississippi River, but only slightly higher due to the valley that parallels the river. The open storage piles in the area are about 60 feet high with some much higher. Other conveyor systems and storage piles in the area are over 70 feet high. There are also transmission towers along the river in this area. According to NSP, the towers are 120 feet high with the low point of the transmission wires about 85 feet high.

The Mississippi River is 700 feet wide along Mile 856.41, the AIS property. Land uses across the Mississippi River on the east bank include open space, residential, and commercial areas. The east side uses are higher in elevation above the river. The river is partially screened from view by vegetation that has grown along the riverbank.. A residential area is located on the east bank of the river. A vacant lot, two small city-owned parks, and several commercial establishments make up the rest of the land uses along the east bank of the river. There are also several industrial uses east of Marshall Street including a large manufacturing plant that runs along Marshall.

D. MPCA VIC PROGRAM PARTICIPATION

The AIS site, including the proposed Kondirator portion, has been used as a scrapyard for many years, and environmental problems there are similar to those at other scrapyards. In 1993, AIS voluntarily entered an agreement with MPCA to perform an environmental cleanup of the site under the auspices of the MPCA Voluntary Industrial Cleanup (VIC) program. The intent of this program is to accomplish voluntary cleanups with a minimum of legal and bureaucratic difficulties. Companies that successfully complete the cleanup can seek a letter from MPCA certifying that no further cleanup is necessary, thus reducing the property's exposure to the threat of environmental liability.

Extensive characterization of the soil and ground water has been performed by AIS under the guidance of the MPCA VIC Program. These studies include a Phase I Audit[12], a Phase II Ground water Investigation[13], and a Phase II Soils Investigation[14] (the latter two performed under a work plan[15] approved by MPCA). In addition, soil samples within the proposed boundaries of the Kondirator have been collected and analyzed. Details on the investigation methods and findings are in the above-referenced documents.

Volatile organic compounds (VOCs) are at very low concentrations in the soil and tend to be confined to surficial soils. Polyaromatic hydrocarbon compounds (PAHs) are above cleanup criteria, and extend to the ground water in some places. Lead, cadmium, barium, and mercury were detected at concentrations above typical naturally occurring levels in samples from the ground surface. Metal concentrations vary widely from location to location and decrease

[12]Barr Engineering Co., 1992, American Iron & Supply Co., Phase I Audit Findings: Prepared for American Iron & Supply Co.

[13]Barr Engineering Co., February 1994, Phase II Ground water Investigation: Prepared for American Iron & Supply Co., 30 p.

[14]Barr Engineering Co., February 1995, American Iron & Supply Company, Phase II Soils Remedial Investigation Report: Prepared for American Iron & Supply Co., 24 p.

[15]Barr Engineering Co., 1992, American Iron & Supply Co., Soil and Ground Water Investigation, Phase II Work Plan: Prepared for American Iron & Supply Co., 14 p.

significantly with depth, suggesting that the detection of metals is due in part to the incorporation of scrap metal in the surficial fill at the site. Table 2 in the *Phase II Soil Remedial Investigation Report* (Barr, February 1995) documents observations of metal fragments in soil samples collected for analysis. Out of 75 samples, visually detectable metal fragments were noted in 74 percent of the samples and 13 percent of the samples had metal fragments that constituted 30 percent or more (by volume) of the entire sample. Chemical analysis of samples is preceded by sample digestion. Therefore, it is reasonable to assume that metal fragments in the soil will account for many of the reported metal concentrations. Polychlorinated biphenyl (PCB) concentrations, with two exception, are below 50 ppm and are typically below 10 ppm or not detectable. Detectable concentrations of PCB compounds are generally confined to samples from the ground surface. The two samples above 10 ppm are above the MPCA action levels. There is some indication that concentrations of PAHs found in the soil at the AIS property will require soil remediation.

Lead, chromium, mercury, selenium, cadmium, and silver were not detected in ground water samples from five monitoring wells at the site, suggesting that the metals in the surficial soil are not leaching to the ground water. Barium has been detected in ground water samples from the three monitoring wells on the eastern (downgradient) side of the site, but at concentrations well below federal standards.

Additional sampling and investigation activities, if any, can be performed prior to or during construction of the Kondirator without affecting Kondirator construction or the integrity of the soil samples. Soils that are excavated in areas where metal or other contaminant concentrations are above action levels will be stockpiled, disposed of, and/or treated in accordance with federal and state laws and regulations.

In general, while testing performed to date indicates that the site has some contamination, the company is making progress toward cleanup to meet MPCA requirements, and the conditions at the site do not preclude construction of the Kondirator project.

It should be emphasized that the VIC cleanup is a separate action from the Kondirator project, and is not the subject of this EAW. The VIC information is presented only in the interests of providing a complete picture of activities and conditions at the site.

E. REMOVAL OF UNDERGROUND STORAGE TANKS

Four underground storage tanks were removed from the AIS property in 1988 and 1989.

In August 1988, one 6,000 gallon unleaded gasoline tank and one 6,000 gallon fuel oil tank were removed. Approximately 150 cubic yards of petroleum contaminated soil were excavated and were thin spread for treatment by Twin City Testing Corporation. The MPCA Tanks and Spills Section concluded that the leaking tank problem has been adequately addressed and remediated. MPCA Tanks and Spills has closed the file on this leak (Site ID#: LEAK00000708).

In April 1989, one 3,000 gallon tank and one 1,000 gallon tank were removed from the north end of the property in front of the aluminum warehouse. AIS had never used these tanks. They were most likely installed by one of the previous owners of the building. (AIS purchased the building in the early 1970s from the Onan Corporation.) AIS removal records indicate the tanks had been used to store fuel oil.

10. Cover Types Estimate the acreage of the site with each of the following cover types before and after development (before and after totals should be equal):

	Before	After		Before	After
Types 2 to 8	0	0	Urban/Suburban Lawn		
Wooded/Forest	0	0	Landscaping	0	1.2
Brush/Grassland	0	0	Impervious Surface	0	1.0
Cropland	0	0	Other (describe)	3.6	1.4

The project site (that is, the Kondirator "footprint") is presently barren and is used for the storage of metals being recycled by AIS. There are no buildings or impervious surfaces on the project site. Hence, 3.6 acres under "Other" encompasses the entire project site.

AIS will create impervious surface areas and buildings will be constructed on the project site as part of the installation of the Kondirator facility. Landscaping will be added along the noise wall and behind the existing riverbank vegetation to augment the natural screening of the AIS property from the river.

11. Fish, Wildlife, and Ecologically Sensitive Resources

a. Describe fish and wildlife resources on or near the site and discuss how they would be affected by the project. Describe any measures to be taken to minimize or avoid adverse impacts.

The project site does not provide habitat for wildlife species. Land within the AIS property is primarily covered with scrap metal, roads, or machinery.

The industrial nature of the project site and continued activity within the facility discourage the use of the area by wildlife species. Upland areas surrounding the AIS property are highly developed with industrial and commercial facilities and, thus, do not provide suitable wildlife habitat.

The Mississippi River is located along the eastern boundary of the AIS property. Fish and wildlife species associated with a river community are expected to inhabit the river near the AIS property. A fisheries survey conducted by the Minnesota Department of Natural Resources (DNR) in 1982 showed that rough fish are the dominant species in this stretch of the river (DNR 1982). Smallmouth bass were found to be the most abundant game fish.

The river corridor is used by water fowl -- mallards, wood ducks, Canada geese -- in their continental migration, according to the DNR. There has been no official census or other studies conducted on the migration of these species in the Twin Cities area.

The project proposed is not expected to affect the migration of these species.

The project is not anticipated to have any adverse impacts on fish and wildlife resources in the Mississippi River. The property changes are too small to affect migration patterns. Water quality of surface runoff from the site will not be adversely affected as a result of constructing the Kondirator. Thus, fisheries habitat will not be affected by the proposed project.

b. **Are there any state-listed endangered, threatened, or special-concern species; rare plant communities; colonial waterbird nesting colonies; native prairie or other rare habitat; or other sensitive ecological resources on or near the site?**
☐ Yes ■ No

If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources was conducted. Describe measures to be taken to minimize or avoid adverse impacts.

The DNR Natural Heritage Program was contacted on August 27, 1991, for information regarding known locations of rare and endangered species or resources in or near the project site. The DNR has determined that there are no known occurrences of rare species or natural features within one mile of the project site.

12. **Physical Impacts on Water Resources Will the project involve the physical or hydrologic alteration (dredging, filing, stream diversion, outfall structure, diking, impoundment) of any surface water (lake, pond, wetland, stream, drainage ditch)?**
■ Yes ☐ No

If yes, identify the water resource to be affected and describe: the alteration, including the construction process; volumes of dredged or fill material; area affected; length of stream diversion; water surface area affected; timing and extent of fluctuations in water surface elevations; spoils disposal sites; and proposed mitigation measures to minimize impacts.

The analysis of impacts on water resources is presented in the following sections:
A. Summary
B. Present Drainage
C. Temporary Sedimentation Basin
D. Regrading Of The AIS Property
D. Permanent Runoff Detention Pond
E. Other Mitigation Measures Considered

A. SUMMARY
Installation of the Kondirator involves several actions that will affect water resources, including:

(1) Remediation of contaminated soils in the ease-southeast portion of the property under the VIC Program.

(2) Construction of a temporary sedimentation basin to capture construction site erosion;

(3) Regrading of the project site and construction of a riverfront earthen berm to direct surface runoff away from the Mississippi River and toward a wet detention pond;

(4) Redirection of roof runoff to catchments located along Pacific Street North, 31st Avenue North, and 28th Avenue North; and

(5) Construction of a permanent, lined wet detention pond to control the quality of runoff waters discharged to the Mississippi River from the project site.

All of the foregoing activities are designed to mitigate potential storm water pollutant discharges from the project site and to improve current storm water runoff management practices.

B. PRESENT DRAINAGE

The AIS property is generally flat, sloping gradually from northwest to southeast. . The surface area of the AIS property is approximately 12 acres, with eight buildings. Rooftop drainage is to the east, off the back of buildings onto the property. Table 12.1 shows present surface acreage for pervious and impervious surfaces. The majority of the AIS property consists of disturbed soil, barren of vegetation. Small pockets of vegetation are present along the Mississippi River. The project site lacks "critical areas" (i.e., sensitive vegetation or animals) needing special protection, excepting the need to control erosion along the river during construction.

Stabilization of the bank along the Mississippi River has been achieved by using defunct river barges. Surface soil samples were collected from the two barges and tested. The results, reported in the *Phase II Soil Remedial Investigation Report* (Barr, February, 1995), show that the barges contain scrap and soil. Concentrations of contaminants are similar to those found in fill material on the AIS property. However, installation of the Kondirator will not limit access to the barges if site remediation is required.

TABLE 12.1
AMERICAN IRON AND SUPPLY SURFACE AREA CALCULATIONS AND RUNOFF FOR PRESENT AND FUTURE CONDITIONS

	Present Surface Area		**Future Surface Area**		**SCS Curve Number**		**Runoff (cubic feet)**	
Entire Site	**Sq. ft.**	**Acres**	**Sq. ft.**	**Acres**	**Present**	**Future**	**Present**	**Future**
Impervious Surfaces								
Buildings Maintenance	71,300	1.6	87,100	2.0	98	98	10,552	12,894
Bituminous Surfaces	9,500	0.2	69,700	1.6	98	98	1,406	10,315
Paved Roads	71,600	1.6	87,100	2.0	98	98	10,597	12,894
Pervious Surfaces								
Remainder of Yard	374,600	8.6	283,100	6.5	91	91	36,525	27,599
TOTAL	527,000	12.1	527,000	12.1	92	94	59,080	63,701
Site Draining To Detention Pond								
Impervious Surfaces								
Buildings Maintenance	0	0.0	13,068	0.3[a]	N/A	98	0	1,934
Bituminous Surfaces	0	0.0	65,340	1.5[a]	N/A	98	0	9,670
Gravel Roads	0	0.0	87,120	2.0	N/A	98	0	12,894
Pervious Surfaces								
Remainder of Yard	0	0.0	213,444	4.9[b]	N/A	91	0	20,811
TOTAL	0	0.0	378,972	8.7	N/A	94	0	45,309

[a]Runoff from the Aluminum Recycling Building, Maintenance Building, the Red Metal Recycling Building and the Office will be redirected to street catchments following future construction.
[b]Pervious area on Mississippi River side of berm excluded from detention pond tributary area.
NOTES:

Runoff based on annual design storm depth of 2.0 inches; corresponds to 1-year, 12-hour duration (Shingle Creek and West Mississippi WMO recommendations).

Runoff for curve number 98 equals 1.78 inches; for curve number 91 equals 1.17 inches.

C. TEMPORARY SEDIMENTATION BASIN

A temporary sedimentation basin is an impoundment that temporarily stores sediment-laden runoff and releases it at a reduced rate. During the time the runoff is detained, sediment settles out of suspension and is trapped in the basin. This prevents sediment from being transported off-site. Sediment basins are relatively effective for trapping coarse- and medium-grained sediment particles. Overall sediment trapping efficiencies up to 70 percent can be achieved with typical sediment basin designs. If higher trapping efficiencies are desired, larger pool volumes and slower discharge rates can be designed. However, the benefit of increased sediment basin size diminishes rapidly beyond a certain threshold basin size. The sedimentation basin for this project will collect storm water runoff from the property and discharge to the Mississippi River. No runoff from the site will be discharged untreated.

The temporary sediment basin at the AIS property, to control sedimentation impacts to the river from construction, will be built at the planned location for the permanent runoff detention pond intended to control post-construction runoff water quality. Temporary sediment basin design will be the same as the permanent basin except an outlet structure will not be installed. The temporary basin will be lined with an impermeable clay liner of at least one foot thickness, to prevent inflow from and infiltration to the ground water. The temporary sediment basin has been designed to contain more than the 67 cubic yards per acre of drainage area (0.5 inch over drainage area) recommended by the MPCA in its publication *MPCA Urban Best Management Practices (BMPs) Handbook: Protecting Water Quality in Urban Areas*, (Division of Water Quality, MPCA, 1989). This basin is designed to remove more than 70 percent of the potentially erodible soil from runoff leaving the construction site.

Soils in the area of the proposed temporary sedimentation basin and permanent runoff detention pond have been sampled in accordance with the MPCA VIC Program Phase II Work Plan. These results are summarized in Question 9, and detailed results can be found in the *Phase II Soil Remedial Investigation Report* (Barr, February 1995).

Soils excavated to construct the temporary basin/detention pond will be tested again as they are removed. If suitable, they will be used on-site as fill. If not, they will be disposed of as hazardous or non-hazardous waste, depending upon the results of the test, in accordance with federal, state and local regulations. Similarly, deposited sediments removed from the temporary basin will be tested, and disposed of as hazardous or non-hazardous waste, depending upon the results of the test, in accordance with federal, state and local regulations.

The site remediation is independent of the Kondirator construction, and thus not the subject of this EAW. Construction of a lined detention basin prevents further scouring of contaminated soil and transport to the Mississippi River, as well as preventing migration of contaminants to the ground water.

A NPDES Construction Site Storm Water permit will be obtained from the MPCA prior to construction of the temporary sedimentation basin. See Question 8.

D. REGRADING OF THE AIS PROPERTY

As part of the AIS's Storm Water Pollution Prevention Plan[16], AIS has been regrading the property to create a riverfront earthen berm. This berm reduces the probability that untreated runoff will enter the Mississippi River from the AIS property. As part of the project, this berm may be completed using materials excavated from the temporary basin/detention pond site. These materials will be tested prior to use and will be used only if suitable for such use. Please see Question 12.C. above and the *Phase II Soil Remedial Investigation Report* (Barr, February, 1995) for more details. If the excavated material from the temporary basin/detention pond site is not suitable, materials will be brought in from off-site.

After Kondirator installation, the project site will be regraded to direct surface runoff to the permanent runoff detention pond (described below). If modification of AIS's NPDES General Permit No. MN G610000 is necessary to complete the berm and/or other site regrading, then an amendment to this permit will be obtained. See Question 8.

E. PERMANENT RUNOFF DETENTION POND

Detention ponds are impoundments that have a permanent pool of water, and also have the capacity to temporarily store storm runoff and release it at a controlled rate. Detention ponds are used to remove suspended sediment and associated pollutants such as trace metals, hydrocarbons, and nutrients (phosphorus and nitrogen) from runoff.

Detention ponds comprise an effective BMP for treatment of storm runoff. Storm runoff entering a detention pond will displace relatively clean water residing in the pond before a storm event. Suspended pollutants in runoff will be subject to removal by settlement before they reach the detention pond outlet. The runoff detained in the pond between storm events undergoes further water quality improvement by additional settlement of very fine particles with extremely slow settling rates.

Research has shown that long-term pollutant removal from runoff by detention ponds is most highly dependent on pollutant inputs during relatively small storms. See the *MPCA Urban BMPs Handbook*. For a more thorough discussion, see Driscoll et al., *Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality* (EPA 440/5-87-001, 1986). High degrees of pollutant removal are achieved for small storm events. Runoff from larger storms will also receive treatment, but not to the high level of smaller storm runoff due to the high volumes of runoff processed and the relatively short hydraulic residence times of the pond during large storms.

The final site plan for the Kondirator facility includes a permanent runoff detention pond. After installation of the Kondirator, the temporary sedimentation basin will be converted to a permanent runoff detention pond. The deposited sediment will be cleaned out of the temporary basin, the impermeable clay liner will be checked (and repaired if necessary), an outlet structure will be installed for the permanent basin, and final project site grading will be completed to direct runoff to the runoff detention pond.

[16] AIS's Storm Water Pollution Prevention Plan was developed pursuant to AIS's NPDES General Permit No. MN G610000.

The permanent runoff detention pond is designed such that the flow-weighted average minimum suspended particle size controlled (i.e., retained) by the detention pond is 4.1 and 4.7 microns, respectively, for the MPCA-recommended storm (1.25 inches in 12 hours) and the Shingle Creek-West Mississippi Watershed Management Organization design storm (2.0 inches in 12 hours). This design is verified using the DETPOND model. A copy of the DETPOND model outputs for "high" concentration and runoff particle size distribution is on file at MPCA and may be reviewed upon request. Identical results were obtained for corresponding simulations using the "low", "medium", and "midwest" concentration and runoff particle size distributions.

The preceding actions will all have physical impacts on water resources in the vicinity of the project site. However, these actions have been designed to be beneficial rather than detrimental and to mitigate potential pollutant loads to the Mississippi River. Outlet controlled runoff to the Mississippi River following the proposed Kondirator installation will improve compared to current runoff water quality from the AIS property. The impacts of storm runoff on the water quality of the Mississippi River are discussed in detail in response to Question 18.

F. OTHER MITIGATION MEASURES CONSIDERED

The MPCA and the city of Minneapolis requested that AIS consider two other mitigation measures - covering or enclosing the material stockpiles and using concrete rather than asphalt to cover the raw material and finished product storage areas. Both requests assumed that raw materials would be contaminated with hydrocarbons or other liquids and the finished product pile would contain particulates from the fragmenting process that could wash off.

1. **Covering Or Enclosing The Material Stockpiles.** AIS considers this measure both impractical and unnecessary. First, the company believes the underlying assumption that the raw materials would be contaminated with hydrocarbons (or other liquids) to be incorrect. AIS maintains that its pollution prevention program to prevent the delivery of scrap containing or contaminated with problematic liquids minimizes this potential. If such material is received, the company's program calls for incoming contaminated scrap to be segregated and handled at the oil/coolant containment facility. See Question 20.F. for a detailed discussion of this program. Second, the company maintains that the finished product pile will not be a source of particulates because the Cascade Cleaning System will effectively remove particulate matter before transfer to the finished product pile. See Question 24.C. for a detailed discussion of particulates and their control. Third, if small amounts of contaminants do reach these stockpiles, the underlying surface will be paved with asphalt and sloped towards the lined runoff detention pond. A skimmer at the pond will remove hydrocarbons before discharge to the Mississippi River. Finally, enclosing these areas is impractical because of the high volume of material processed (100 tons/hour) and because of the method of handling the material (cranes and conveyors). The latter are too tall to be enclosed in a cost effective manner.

   One issue not dealt with above is the possibility that particulates adhering to the finished product might get into the river if shredded product material is spilled into the river in the process of loading into barges. This might add to the potential for contamination in the river that would drive up ecological risks. However, the company's position is that the product is effectively cleaned in the Cascade Cleaning System. The minuscule amounts of dust remaining would be insignificant. Furthermore, the loading activity will incorporate a collar around the barge opening to minimize spillage.

2. **Asphalt vs. Concrete For Surfacing The Storage Areas.** Again, AIS considers that concrete need not replace asphalt as the paving material for the raw materials and finished product storage areas. First, AIS contends that the underlying assumption that the raw materials would be contaminated with hydrocarbons (or other liquids) is again incorrect. Second, either asphalt or concrete can be designed to withstand the material loadings and any transfer or loading equipment. Standard road and industrial storage area designs will be employed. Third, there should also be no concern regarding drips or spills of oil onto an asphalt pad leading to degradation of the asphalt. AIS believes that the addition of small amounts of oil to asphalt is not detrimental and will not lead to cracking or changes in the permeability. The MPCA remains concerned about this matter, and further notes that concrete is structurally more resistant to such effects as weathering.

13. Water Use

a. Will the project involve the installation or abandonment of any wells? ☐ Yes ■ No

For abandoned wells give the location and Unique well number. For new wells, or other previously unpermitted wells, give the location and purpose of the well and the Unique well number (if known).

The project will not require the installation or abandonment of any wells, unless it is determined that well MW-5 must be abandoned due to its proximity to the storm water detention basin. This proximity might cause contamination to ground water if the basin ever overflows. In this case, a new well may have to be drilled. The VIC Program will make this determination.

b. Will the project require an appropriation of ground or surface water (including dewatering? ☐ Yes ■ No

If yes, indicate the source, quantity, duration, purpose of the appropriation, and DNR water appropriation permit number of any existing appropriation. Discuss the impact of the appropriation on ground water levels.

The project will not require the use of ground water for operations or construction. Excavation depth for footings will be well above the water table, making dewatering activities unnecessary during construction.

c. Will the project require connection to a public water supply? ☐ Yes ■ No

If yes, identify the supply, the DNR water appropriation permit number of the supply, and the quantity to be used.

The city of Minneapolis water supply will be utilized for the project. The estimated water use is 1,320 gallons per day for makeup, based on an Osborn Engineering technical memorandum dated July 10, 1990. This memorandum indicates the venturi scrubber will require an initial charge of approximately 17,420 gallons. This water is recirculated in a closed loop at a rate of 500 gallons per minute. The makeup water requirement will be due to evaporation and saturation of the air stream and will vary depending on weather conditions. The makeup requirement is estimated to average 2 gallons per minute. Assuming 11 operating hours per day, this will total approximately 1,320 gallons per day. The city of Minneapolis utilizes Mississippi River water appropriated under DNR Water Appropriations Permit No. 78-6216.

14. Water-related Land Use Management Districts Does any part of the project site involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ■ Yes ☐ No

If yes, identify the district and discuss the compatibility of the project with the land use restrictions of the district.

A. CITY OF MINNEAPOLIS SHORELAND ZONING DISTRICT

The AIS property is within the 300 foot Shoreland District established by Minneapolis Code of Ordinances, Title 20 - Zoning Code, Chapter 560. The project meets or exceeds the requirements of the ordinance except the limitation on height.[17] The company is in litigation with the city over this height requirement.

B. MISSISSIPPI NATIONAL RIVER AND RECREATION AREA

The AIS property is also part of the Mississippi National River and Recreation Area. AIS believes the property is in conformance with policies and recommendations of the proposed Area Plan. Further discussion on the Area Plan can be found under Question 28.

C. FLOODPLAIN

The AIS property is outside the 100-year floodplain area of the Mississippi based on information from *Flood Insurance Study, city of Minneapolis, Hennepin County, Minnesota, 1980 Federal Emergency Agency-Federal Insurance Administration, National Food Insurance Program.*

The proposed detention pond will be excavated at or below the 100-year flood level, although higher ground, above the 100-year level, will separate the pond from the river. A gate will be installed if necessary to prevent backflow from the river to the detention pond during a 100-year flood event.

15. Water Surface Use Will the project change the number or type of watercraft on any water body? ☐ Yes ■ No

If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other users or fish and wildlife resources.

A. CURRENT AND HISTORICAL BARGE TRAFFIC

Current commercial barge traffic passing through the St. Anthony lock to the Mississippi River north of the Lock is estimated by the Minnesota Department of Transportation, Ports and Waterways Section, to be between 1.6 and 2.1 million tons per year. Assuming an average barge capacity of 1,500 tons, this is equivalent to approximately 1,000 to 1,400 barges per year.

The capacity of the St. Anthony Lock is approximately 5-6 million tons per year, or approximately 3,300 to 4,000 barges per year. Thus, the current traffic is well below the capacity of the Lock to accommodate this traffic.

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[17]See Footnote 8 for a description of the dispute between AIS and the city over whether a height variance is required.

In the past, the Lock handled approximately 3.5 million tons when Northern States Power Company received eastern coal shipments by barge at their Riverside Power Plant. When NSP switched to western coal delivered by rail, the total tonnage through the Lock dropped to about two million tons per year, its current rate.

Today, barges are generated by the following entities:

American Iron & Supply Company
Holnam, Inc.
River Services, Inc.
Port Broadway
Shiely Company

Shiely Company accounts for 750,000 tons or approximately one half of the current total.

B. AIS BARGE TRAFFIC AND PROJECT IMPACT

Inbound shipments to AIS of unprocessed scrap metal account for only two barges a year. Since a market is developing in barge loads of baled scrap suitable for shredding, the number of inbound barges per year carrying scrap for processing could rise to a maximum of 40. Since as noted below, the number of outbound barge shipments is limited by project output and the shipping season, and since these barges would be reloaded before returning downriver, the total barge traffic predicted below would not be dependent on this market.

Current outbound shipments of processed scrap account for 40 barges per year. Future outbound shipments by barge are not expected to exceed 50 percent of total finished product shipments because of customer requirements and the winter closure of the river to barge traffic. With an expected maximum production from the project and all other AIS operations of 426,850 tons per year, 50 percent of shipments by barge at 1,500 tons per barge will require 143 barges. Thus, a maximum increase of 103 barges per year is expected.

The increase in total barge traffic through St. Anthony Lock due to the proposed project will range from nine percent if the current higher volume of 1,400 barges per year is assumed, to 13 percent if the current lower volume of 1,000 barges is assumed. Barge demand, however, will remain well below the Lock capacity of 3,300 to 4,000 barges per year. Thus, no conflicts with other users of the waterway are anticipated.

The additional barge use by AIS will not require any additional barge fleeting. Dakota Barge Service, Inc., one of the barge suppliers for AIS, indicated that sufficient fleeting space exists in St. Paul, and barges would be delivered to AIS on call, if available.
Barge docking operations at AIS will follow current procedures.

16. Soils Approximate depth (in feet) to:

Ground Water: minimum 10.3 **average** 13.1
Bedrock: minimum 100 **average** 100-150

Describe the soils on the site, giving Soil Conservation Service (SCS) classifications, if known. (SCS interpretations and soil boring logs need not be attached.)

The SCS has not classified urban soils in this part of Minneapolis. Twin City Testing Corp. geotechnical borings describe the surficial soils as 4 to 7 feet of fill consisting of silty and clayey dark gray to brown sand with cinders, gravel, concrete, wood, and metal. Below the surficial fill and to a depth of at least 30 feet is coarse alluvium consisting of light gray to light brown sand with some gravel. The sand and gravel deposits are interpreted to be alluvial middle terrace deposits of the Mississippi River, which are typically 100 to 150 feet thick in the vicinity of the site.

In situ tests were performed to estimate values of hydraulic conductivity were conducted in five monitoring wells installed at the AIS property as part of AIS's Phase II Soil and Ground water Investigation, pursuant to the MPCA VIC Program[18]. The average value of hydraulic conductivity in alluvium was calculated to be 512 ft/day. No information is available on the conductivity of the fill material present.

17. Erosion and Sedimentation Give the acreage to be graded or excavated and the cubic yards of soil to be moved:

acres 6.0 **; cubic yards** 9,700 **.**

Describe any steep slopes or highly erodible soils and identify them on the site map. Describe the erosion and sedimentation measures to be used during and after construction of the project.

The AIS property is approximately 12 acres in area. Kondirator installation will cause 50 percent of the AIS property to be regraded to promote runoff drainage to a permanent detention pond. That detention pond will be excavated on site to contain 1.22 acre-feet of permanent water volume, and 0.35 acre-feet of temporary flood storage volume. The pond will be excavated in the earliest phase of construction to serve as a temporary sediment basin, and accumulated sediments will be removed at the end of construction. This basin will then be fitted with an outflow structure and operated thereafter as a permanent wet detention pond for runoff water quality control. (The temporary sediment basin and wet detention pond were discussed fully in response to Question 12.) An earthwork balance analysis conducted for the proposed project indicates there will be 6,900 cubic yards of excavation and 2,800 cubic yards of filling required, leaving 4,100 cubic yards of earth to be stockpiled on-site or disposed of.

The AIS property lacks any steep slopes or particularly erodible soils. The waterfront along the Mississippi River is being bermed and protected from erosion by AIS. Plans for Kondirator installation at the AIS property include completion of the earthen berm along the riverbank. The completed berm will act as a barrier to site runoff, directing it away from the Mississippi River and toward the on-site runoff detention pond.

Other erosion control practices planned for the AIS property during Kondirator installation include silt fencing and temporary rock construction entrances. A silt fence is a temporary sediment barrier consisting of a filter fabric which is attached to supporting posts and trenched into the ground. Sediment-laden runoff ponds uphill from the silt fence and runoff is filtered as it passes through the fabric. Silt fences are intended to intercept and detain small amounts of sediment from disturbed areas in order to prevent sediment from leaving the construction site. Silt fencing will be used in conjunction with the temporary sediment basin on the AIS property during construction.

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[18]Barr Engineering Co., February 1994, American Iron & Supply Co., Phase II Ground Water Investigation: Prepared for American Iron & Supply Co., 30 p.

MPCA notes that AIS plans to start construction in spring, which is typically a wet time of year. The temporary detention basin must be sized to handle the runoff adequately.

Temporary rock construction entrances to the AIS property will be used during Kondirator installation to reduce the mud tracked onto adjacent paved roads. A temporary rock construction entrance is a stone pad located at points where vehicles leave a construction site. The stone pad consists of clean rock designed in such a fashion that vehicle tires will sink in slightly. This helps remove mud from the tires as the vehicle passes over the pad. The temporary rock entrance pads will be constructed according to MPCA design guidelines included in the *MPCA BMPs Handbook: Protecting Water Quality in Urban Areas*, Section 6.7 Temporary Rock Construction Entrance (Division of Water Quality, 1989). Periodic top dressing of the rock pads with additional rock will be made as the rock voids become clogged with mud.

During Kondirator installation, other construction site erosion and sediment control BMPs will be used if conditions suggest they are necessary or would be beneficial. The project engineer will make such determinations and order implementation of other BMPs, if necessary, during the process of construction observation.

18. Water Quality - Surface Water Runoff

a. Compare the quantity and quality of site runoff before and after the project. Describe methods to be used to manage and/or treat runoff.

A. SUMMARY

Runoff water quality modeling of the AIS property using the P-8 Urban Catchment Model (Walker, 1989) (the "P-8 Model") indicates that the permanent runoff detention pond planned for the project site will capture 92 percent of Kondirator-generated particles and 71 percent of the total solids suspended in the AIS property runoff (based on Shingle Creek/West Mississippi River Watershed management Organization design storm of two inches of rain in 12 hours.) These estimates assume a ten-day antecedent period of dry weather. even though the average interval between storm events in Minneapolis is only 74 hours, or a little over three days, for the June to September period, and 87 hours, or three and one-half days, on an annual basis.

AIS currently possesses NPDES General Permit No. MN G610000, issued by the MPCA and, as noted in Question 12, has also prepared a Storm Water Pollution Prevention Plan (SWPPP) for the entire AIS property its present configuration. This SWPPP will be updated to address any potential storm water runoff contamination problem that might result from installation of the Kondirator. Detention ponding of runoff from the AIS property is expected to mitigate any such problems, however, as is described below.

As noted in the answer to Question 21, there will be no discharge of blow-down water from the scrubber. The scrubber is a closed system, with the water being continuously re-circulated between the scrubber and a heated, enclosed concrete settling pit. Wastes will be removed from time to time, as discussed in the answer to Question 21, and make-up water from the city of Minneapolis water system will be added to replace water which evaporates, as discussed in the answer to Question 13. However, there will be no blow-down of scrubber water, either to municipal sewers or to the permanent runoff detention pond.

B. RUNOFF WATER QUALITY MODELING

Surface water runoff from the project site will be collected into a permanent runoff detention pond before it is discharged to the Mississippi River. The runoff detention pond has been designed to conform with the requirements of the local water management organizations and to treat runoff to an acceptable quality level before discharge. The philosophy for designing the storm water detention basin was twofold:

(1) Design the basin large enough for 10 years of sediment accumulation and sufficient to properly store and treat runoff from the two-inch in 12 hours design storm; and

(2) Modify the design if necessary, to assure compliance with applicable in-stream water quality standards, and achieve an estimated total suspended sediment (TSS) removal efficiency of 70 percent.

Detention pond design, based solely on hydrologic and hydraulic considerations, followed local, state, and federal recommendations (Shingle Creek/West Mississippi River Watershed Management Organization, Soil Conservation Service Minnesota Hydrology Guide, and Technical Release 8, *MPCA Urban Best Management Practices Handbook*, for the two-inch depth in 12 hour duration storm event). Basin morphometry, outlet structure design, and inflow-outflow characteristics were then further evaluated using the design features of the P-8 Model to achieve at least an estimated 70 percent TSS removal. P-8 modeling results and associated runoff water quality computations are on file at MPCA and available for review on request.

The P-8 Model's primary application is for predicting the generation and transport of storm water runoff pollutants in urban catchments. The P-8 Model has been calibrated for various urban runoff concentrations observed under the National Urban Runoff Program (NURP). Assumptions were made during the modeling analysis in an effort to more closely represent the conditions at the project site. These assumptions include a daily particle deposition rate of 2.07 lbs. per acre per day from the Kondirator. This deposition rate was taken from the results of air quality modeling performed to estimate stack and fugitive emissions. See Question 25 for details of this air quality modeling. Using arithmetic averages of on-site deposition, averaging both across years and across on-site receptors, the deposition of particulates on site was estimated to be 84.9 g/m^2 (2.07 lbs/acre) per day over the area draining to the permanent runoff detention pond.

Wet deposition of particulate matter on the AIS property was also calculated to determine if it represented a significant additional pollutant loading on the runoff detention pond. Using an average precipitation rate of 26 inches per year, an ambient air total suspended particulates concentration of 3.9 $\mu g/m^3$, and a scavenging ratio of 2,000 (dimensionless, [kg/kg]), wet deposition was calculated to be 209 lbs./yr. over the whole site (1.96 g/m^2). This was considered to be negligible in comparison to the 2.07 lbs./acre/day dry deposition rate, and, therefore, was ignored.

Deposition of these particles was assumed to be distributed, according to particle diameter, as shown in Table 18.1 based on air quality modeling results:

TABLE 18.1
TABLE PARTICLE DEPOSITION RATE

Particle Size Range (microns)	**Deposition Rate (lbs./ac./day)**
40-80	0.92
30-40	0.10
10-30	0.54
<10	0.13

The assumed chemical composition of Kondirator-generated particles was based on information taken from MSDSs for scrap carbon steel, stainless steel scrap, scrap aluminum, scrap brass, scrap copper, scrap cast iron, scrap iron, scrap galvanized steel and non-metallic scrap. See Table 18.2. Particles were assumed to have constant chemical composition and a specific gravity of 8.0. Settling velocities were calculated for the four particle size ranges according to Stoke's Law for particles of 57, 35, 17, and 2 microns. These calculated settling velocities were used to assign the Kondirator-generated particles to size categories within the NURP data set for P-8 modeling.

TABLE 18.2
NORMALIZED CHEMICAL COMPOSITION OF MASS-WEIGHTED, AVERAGE SCRAP INPUT TO THE AIS KONDIRATOR FACILITY[a]

Constituent	Percentage of Total Input Mass
Aluminum	1.76
Antimony	0.03
Arsenic	0.12
Beryllium	0.05
Boron	0.10
Cadmium	0.08
Calcium	0.10
Carbon	1.97
Chromium	0.71
Cobalt	0.44
Copper	1.84
Iron	90.17
Lead	0.38
Lithium	0.08
Magnesium	0.35
Manganese	2.04
Molybdenum	0.31
Nickel	0.96
Niobium	0.10
Silicon	0.71
Silver	0.05
Tin	0.59
Titanium	0.10
Tungsten	0.40
Vanadium	0.22
Zinc	0.74
Zirconium	0.10
TOTAL	104.46

[a]Based on average composition data from Materials Safety Data Sheets for assumed inputs of 90 percent Carbon Steel Scrap, two percent Stainless Steel Scrap, two percent Aluminum Scrap, one percent (total)Cast Iron Scrap, Iron Scrap, Copper Scrap, Galvanized Steel Scrap, and Brass Scrap and five percent nonmetallic scrap. All constituents which appear as pollutants of concern on the lists associated with either the Toxicity Characteristic Leachate Procedure, the U.S. Clean Air Act, or the Minnesota Air Toxics Review Guide were set equal to the upper end of their tabulated concentration ranges, if reported as less than or equal to a minimum concentration. Levels of other unlisted constituents were assumed to be equal to either their tabulated values or the high end of reported concentration ranges.

Approximately 93 percent of Kondirator-generated particles deposited on the AIS property were determined to have settling velocities that corresponded to particles above the 80th percentile of NURP particle sizes, meaning that Kondirator particles settle faster. The remaining seven percent of the particles fall in the 30th percentile of NURP particle sizes.

Parameters used in the P-8 Model to develop the NURP TSS concentrations for the 90th percentile site (90 percent of the sites studied in the National Urban Runoff Program had lower concentrations) were used to simulate the amount of eroded particles that would originate at the AIS property independent of the Kondirator. The deposition of Kondirator-generated particles was then assumed be additive to these concentrations. It was assumed that all of the Kondirator-generated particles on the AIS property would be washed off into the detention pond during the design storm following a ten day dry period. An additional conservative assumption used in performing the P-8 analysis was no leakage through the runoff detention basin bottom.

The design of the runoff detention pond was also analyzed using the DETPOND model. The DETPOND analysis shows that the flow-weighted average minimum suspended particle size controlled (i.e., retained) by the detention pond is 4.1 and 4.7 microns, respectively, for the MPCA-recommended design storm (1.25 inches in 24 hours) and the Shingle Creek-West Mississippi Watershed Management Organization design storm (2.0 inches in 12 hours). A copy of the DETPOND model output for the "high" concentration and runoff particle size distribution is shown in Attachment 6. Identical results were obtained for corresponding simulations using the "low", "medium", and "midwest" concentration and runoff particle size distribution.

Table 18.3 shows estimated pollutant loads and runoff detention pond removal efficiencies predicted by the P-8 Model. The chemical composition of particles characteristic of urban runoff was checked against that of Kondirator-generated particles. Wherever a disparity was found, the higher of the two concentrations was chosen and was assumed to apply to the AIS property.

The table shows that approximately 71 percent of the TSS load will be removed in the runoff detention pond during the design storm. Also, approximately 92 percent of the Kondirator-generated particles would be removed in the pond.

The "dead" storage volume (i.e., volume below the outlet elevation) of the runoff detention pond is designed to be 1.22 acre feet upon construction. Ten years of normal sediment accumulation is expected to reduce this volume by only 0.023 acre-feet, or 1.9 percent. This trivial reduction in dead storage volume will not affect the runoff detention pond's pollutant removal abilities.

TABLE 18.3
STORM WATER WET DETENTION BASIN INFLOW AND OUTFLOW CHARACTERISTICS FORECASTED BY THE P-8 MODEL FOR THE AIS WET DETENTION BASIN[a]

	Inflow		Outflow		Percent Removal
Parameter	Load (lbs)	Event Mean Conc. (mg/l)	Load (lbs)	Event Mean Conc. (mg/l)	
NURP-reported and Kondirator-generated Particles Combined					
Total Suspended Solids	933.5	328.3	271.6	95.5	70.9
Total Phosphorus	2.2	0.79	0.85	0.30	61.9
Total Kjeldahl Nitrogen	10.3	3.7	3.9	1.4	62.0
Copper	0.3	0.1	0.10	<0.1	62.1
Lead	0.1	<0.1	0.04	<0.1	71.4
Zinc	1.6	0.6	0.6	0.21	61.8
Hydrocarbons[b]	13.6	4.8	4.1	1.5	70.0
Kondirator-generated Particles[c] Only					
Total Suspended Solids	117.4	38.7	9.0	3.0	92.3
(Aluminum)	1.0	0.3	<0.1	<0.1	
(Antimony)	<0.1	<0.1	<0.1	<0.1	
(Arsenic)	0.1	<0.1	<0.1	<0.1	
(Beryllium)	<0.1	<0.1	<0.1	<0.1	
(Boron)	0.1	<0.1	<0.1	<0.1	
(Cadmium)	0.1	<0.1	<0.1	<0.1	
(Calcium)	0.1	<0.1	<0.1	<0.1	
(Carbon)	2.2	0.7	0.2	<0.1	
(Chromium)	0.8	0.3	<0.1	<0.1	
(Cobalt)	0.5	0.2	<0.1	<0.1	
(Copper)	0.3	0.1	<0.1	<0.1	
(Iron)	106.4	35.1	8.2	2.7	
(Lead)	0.3	0.1	<0.1	<0.1	
(Lithium)	<0.1	<0.1	<0.1	<0.1	
(Magnesium)	0.1	<0.1	<0.1	<0.1	
(Manganese)	2.4	0.8	0.2	<0.1	
(Molybdenum)	0.2	<0.1	<0.1	<0.1	
(Nickel)	1.1	0.4	<0.1	<0.1	
(Niobium)	0.1	<0.1	<0.1	<0.1	
(Silicon)	0.4	0.1	<0.1	<0.1	
(Silver)	<0.1	<0.1	<0.1	<0.1	
(Tin)	0.4	0.1	<0.1	<0.1	
(Titanium)	0.1	<0.1	<0.1	<0.1	
(Tungsten)	0.1	<0.1	<0.1	<0.1	
(Vanadium)	0.2	<0.1	<0.1	<0.1	
(Zinc)	0.1	<0.1	<0.1	<0.1	
(Zirconium)	0.1	<0.1	<0.1	<0.1	

Note: Footnotes are on next page.

[a]Based on 2 inches of precipitation in 12 hours, per basin design criteria of the West Mississippi Water Management Organization. (Assumes a 10-day antecedent dry weather period.)
[b]Excludes anticipated removal efficiency of oil skimmers (i.e., oil-grit separators).
[c]Particles with diameters and/or settling velocities equivalent to or exceeding those of the 80th percentile of NURP - reported data, predominantly. Includes 93 percent of Kondirator-generated particles, and the remaining seven percent of Kondirator-generated particles that fall in 30th percentile of NURP-reported data.

b. Identify the route(s) and receiving water bodies for runoff from the site. Estimate the impact of the runoff on the quality of the receiving waters.

Storm water runoff from the project will be discharged to the Mississippi River following on-site treatment by settling. The MPCA water quality classification of the Mississippi River between the northwest city limits of Anoka and St. Anthony Falls, the reach where AIS is located, is Class 1C for Domestic Consumption, Class 2Bd for Fisheries and Recreation and 3B for Industrial Consumption. The 1C Domestic Consumption classification means the quality of water must be sufficiently purified using technology for domestic use. The 2Bd Fisheries and Recreation classification means this reach of the Mississippi River is intended to permit the propagation and maintenance of cool or warm water sport or commercial fishes and their habitats and be suitable for aquatic recreation of all kinds. The 3B Industrial Consumption classification means the quality of water shall be sufficient for industrial cooling and material transport use, without a high degree of treatment to avoid fouling.

The proposed design of the runoff wet detention pond for the project will result in compliance with MPCA water quality standards for the Mississippi River when dilution of the detention basin effluent by the river is considered.

19. Water Quality - Wastewaters.

a. Describe sources, quantities, and composition (except for normal domestic sewage) of all sanitary and industrial wastewaters produced or treated at the site.

The AIS property will generate and discharge only normal domestic sewage to the city of Minneapolis sanitary sewer lines. All water used to collect dust in the venturi scrubber is pumped from the concrete resettling pit (part of the air pollution control equipment) and recirculated to the scrubber.

b. Describe any waste treatment methods to be used and give estimates of composition after treatment, or if the project involves on-site sewage systems, discuss the suitability of the site conditions for such systems. Identify receiving waters (including ground water) and estimate the impact of the discharge on the quality of the receiving waters.

Not applicable.

c. If wastes will be discharged into a sewer system or pretreatment system, identity the system and discuss the ability of the system to accept the volume and composition of the wastes. Identity any improvements which will be necessary.

Not applicable.

20. **Ground Water - Potential for Contamination**

a. **Approximate depth (in feet) to ground water: 10.3 minimum; 13.1 average.**

b. **Describe any of the following site hazards to ground water and also identify them on the site map: sinkholes; shallow limestone formations/karst conditions; soils with high infiltration rates; abandoned or unused wells. Describe measures to avoid or minimize environmental problems due to any of these hazards.**

The description of hazards to ground water and efforts to minimize these is presented in the following sections:

A. Summary
B. Sinkholes And Infiltration Rates
C. Unused Wells
D. Ground Water Flow, Direction, And Rate
E. Ground Water Quality
F. AIS's Pollution Prevention Program
G. AIS' Storm Water Pollution Prevention Program
H. Project Mitigation Measures

A. SUMMARY

The AIS property overlies a thick (100-150 foot) horizon of alluvial sand and gravel. Regional ground water flow is toward the Mississippi River. Ground water flow at the site is east to northeast and discharges into the Mississippi River. Average ground water velocity across the site is 6.1 ft/day.

Five monitoring wells were installed at the AIS property as part of AIS's participation in the MPCA VIC Program. Samples collected and analyzed from the monitoring wells indicate that a chlorinated solvent plume is flowing underneath the AIS property from an unknown source west of the property. Biodegradation of the plume appears to be taking place underneath the AIS property.

The MPCA VIC staff has requested a third round of ground water analysis to further evaluate the status of ground water conditions.

Barium has entered the ground water from the AIS property, but concentrations of barium in the ground water are well below water-quality standards. Lead, cadmium, mercury, chromium, silver, selenium, and antimony have not been detected in any samples from the well. Sampling of wells at the AIS property found that PCBs were detected in the first round of analysis, but were below detection limits in the second round.

AIS has in place a pollution prevention program and a comprehensive storm water management program. project mitigation measures to protect ground water include the storm water runoff detention pond, impervious surfaces under raw material and finished product stockpiles, and direct deposit of solid wastes generated by the Kondirator into enclosed containers.

B. SINKHOLES AND INFILTRATION RATES

There are no known or suspected sinkholes in the vicinity of the AIS property. The bedrock below the AIS property is thought to be St. Peter Sandstone (depth 100-150 feet). Prairie du Chien Group (dolomite, limestone, and shale) may subcrop underneath the Mississippi River.

Fill material overlies natural alluvium over the entire AIS property, ranging from 3 to 12 feet in thickness. The upper fill material soils are clayey sand or clayey sand with gravel to brown silty sand. The fill material soils are generally very densely packed and hard,[19] likely resulting in relatively low vertical hydraulic conductivity values and low infiltration rates. Average horizontal hydraulic conductivity for the soils at the water table was calculated to be 512 ft/day[20] in the alluvium. This does not apply to the fill material.

C. UNUSED WELLS

There was one unused well on the AIS property inside the aluminum recycling building that was abandoned by a licensed well driller. E. H. Renner & Sons, Inc. completed abandonment on September 19, 1994. The Well And Boring Sealing Record is included as Attachment 8. A monitoring well from the early 1980s was searched for but not found. Excavation activities in the southeast portion of the site must be done carefully during regrading and detention basin construction. If this well is found, and is screened in the water table, it must be closed according to state requirements.

D. GROUND WATER FLOW, DIRECTION, AND RATE

Regional ground water flow is east toward the Mississippi River. Vertical gradients in the bedrock aquifers in the vicinity of the river are upward and the Mississippi River is a major discharge area for ground water. Upward vertical gradients will greatly hinder downward migration of ground water contaminants, if any.

Five monitoring wells were installed at the AIS property as part of the Phase II Soil and Ground water Investigation that is being conducted under the auspices of the MPCA VIC Program. These wells are screened at the water table. Three wells are located along the eastern edge of the AIS property, downgradient of all site activities, and two are located along the western edge of the AIS property, upgradient of all site activities. These wells were surveyed and water levels have been measured on several occasions with minimal water-level fluctuation. Contours of the elevation of the water table are shown on materials on file at MPCA.

Ground water flows generally west to east across the AIS property under unconfined conditions toward the Mississippi River. Underneath the northern portion of the AIS property, flow is somewhat more northeasterly. The water table is in natural, fluvially deposited sand and gravel and in fill material.

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[19]Barr Engineering Co., February 1995, *American Iron & Supply Company, Phase II Soils Remedial Investigation Report*: Prepared for American Iron & Supply Co., 24 p.

[20]Barr Engineering Co., 1994, *American Iron & Supply Co., Phase II Ground Water Investigation*: Prepared for American Iron & Supply Co., 30 p.

The average ground water velocity across the AIS property is calculated to be 6.1 feet/day. Ground water is considered to discharge into the Mississippi River.

E. GROUND WATER QUALITY

Two rounds of ground water sampling and analyses have been performed at the AIS property[21]. Samples were analyzed for VOCs, base-neutral extractable compounds (including PAHs), RCRA metals, diesel-range petroleum compounds, and PCBs. Samples were collected and analyzed under procedures outlined in the Phase II Work Plan and Quality Assurance Project Plan[22].

The primary deviation from the modifications to the work plan requested by MPCA was in the sampling procedures, including monitoring well development and mercury sampling procedures. Ground water samples for mercury analysis were collected after filtering through a 0.45 µm filter, as is standard practice for other RCRA metals. MPCA expressed concern that this sampling methodology would result in some volatilization of mercury and recommended the use of a flow-through sampling chamber. It is possible that some mercury volatilization may have taken place.

Mercury was not detected, however, in any ground water sample, nor was it detected in any soil sample at depth. See Question 9.

MPCA also suggested sampling for non-RCRA metals, such as manganese and aluminum. Since primary drinking water standards for many these metals are either extremely high or not promulgated, the collection of such data was not deemed to be of value for the purpose of the Phase II investigation. MPCA has requested an additional round of ground water analysis due to concerns over proper sampling procedures.

1. **Ground Water Quality Entering the AIS Property.** The quality of the ground water entering the AIS property from upgradient areas is characterized by the water quality of samples collected from monitoring wells MW-1 and MW-2. The following VOCs were detected in upgradient wells: 1,1-dichloroethene; 1,1,1-trichloroethane; trichlorethene; 1,1,2-trichloroethane; 1,2-dichloroethene; and 1,2-dichloroethane. Concentrations of 1,2-dichloroethane and 1,1,1-trichloroethane were detected above Minnesota Recommended Allowable Limits (RALs) and federal Maximum Concentration Limits (MCLs). These constituents are believed to be the result of a solvent-related plume and biodegradation daughter products originating from an unknown source west of the AIS property.

2. **Ground Water Quality Leaving the AIS Property.** The quality of ground water leaving the AIS property (on the eastern side of the AIS property) is characterized by the water quality of samples collected from monitoring wells MW-3, MW-4, and MW-5. All of the solvent-related VOCs detected in the upgradient wells were also detected in these downgradient wells. The concentrations of the solvent-related compounds were detected at lower concentrations in the downgradient wells than in the upgradient wells (except 1,2-dichloroethene). Slightly higher concentrations of 1,2-dichloroethene are believed to be the

[21]Barr Engineering Co., 1994, *American Iron & Supply Co., Phase II Ground Water Investigation*: Prepared for American Iron & Supply Co., 30 p.

[22]Barr Engineering Co., 1992, *American Iron & Supply Co., Soil and Ground Water Investigation, Phase II Work Plan*: Prepared for American Iron & Supply Co., 15 p.

result of continued degradation of the solvent-related plume flowing under the AIS property from the west. Detection of low levels of vinyl chloride in the downgradient wells also provide support that the solvent-related plume is biodegrading underneath the AIS property as it flows toward the Mississippi River.

Barium was the only metal detected in all three downgradient monitoring wells. The concentrations of barium were approximately one-half of the barium RAL and MCL. Lead, cadmium, mercury, chromium, silver, selenium, and antimony were not detected in any samples from any wells.

Trace levels of one PCB compound (Arochlor 1254) were detected in monitoring wells MW-3 (0.8 μg/L) and MW-4 (0.5 μg/L) during the first sampling round. No PCB compounds were detected during the second sampling round. Detection of trace levels of Arochlor 1254 during the first sampling round is believed to be the result of incomplete well development (i.e. some colloidal PCB from the surficial soil was not removed from the well bore). Additional pumping during sampling removed this colloidal material, and there was no further detection of PCB compounds in the ground water.

F. AIS'S POLLUTION PREVENTION PROGRAM

AIS states that it does not process or dispose of hazardous substances, pollutants, or contaminants. To avoid accidental contamination of its site, AIS pursues a proactive pollution prevention program, and the company describes that program as follows:

First, AIS has developed and adopted a corporate environmental policy which includes an Environmental Program designed to "assure an environmentally safe workplace." AIS's written material pertaining to this program and requirements placed on those who deliver scrap to AIS for processing are available for review on request.

Second, to implement this program, AIS hired a full-time Environmental Manager in 1990. The Environmental Manager addresses both environmental compliance at AIS and with AIS's suppliers.

Third, AIS's environmental manager has developed specifications for recyclables which comply with local, state, and federal solid and hazardous waste regulations. These written specifications address appliances, automotive scrap metal, barrels, containers, tanks, and used oil filters. For example, scrap metal accepted at the facility must be drained of fluids, including oils, fuels, solvents, and refrigerants.

Fourth, AIS works with customers to keep hazardous substances, pollutants, and contaminants from entering its site with the scrap metals received. To do this, AIS communicates its specifications to customers by mailings, publishes a newsletter for customers which addresses environmental issues, and maintains signs at the AIS property regarding prohibited materials. In addition, AIS's Environmental Manager and sales representatives also work with customers to educate them about the specifications and to assure compliance.

Fifth, AIS's Environmental Manager makes site visits to large suppliers to assess their environmental practices. If deviations from AIS's specifications are noted or other problems observed, the Environmental Manager works with the supplier to correct the problems.

Sixth, the truck scale at AIS's facility is monitored by closed circuit television. Any load detected here as containing material that does not meet specifications is prohibited from entering the AIS facility.

Seventh, AIS has installed a radiation detection system at its truck scale. Any load detected as containing radiation is prohibited from entering the AIS facility.

Eighth, each barge, rail car, and truck entering the facility is inspected as it is being unloaded. AIS's crane operators and other personnel look for materials which do not meet specifications and for any free flowing liquid. Any item which does not meet AIS's specifications is rejected and must be removed from the site in the same barge, rail car, or truck in which it arrived.

Ninth, AIS's crane operators inspect material as they move and load it. If scrap is discovered that does not meet specifications, the crane operator separates it for attention by the Operations Manager. If liquids are detected, the crane operator calls the Operations Manager, who investigates and determines if the Environmental Manager needs to be contacted.

Tenth, an additional inspection takes place at the shear and the baler by operating personnel. The same procedures are employed as with crane operators. Material not meeting specification or detection of liquids results in a call to the Operations Manager.

Eleventh, AIS trains its personnel to enforce its specifications.

Twelfth, AIS's Environmental Manager keeps abreast of state and federal solid and hazardous waste laws and regulations. This enables AIS to modify its written specifications and business practices to comply with changes in laws and regulations.

All these practices would continue after installation of the Kondirator, including inspection of material at the time of processing. The operating booth for the Kondirator permits the operator to observe material on the infeed conveyor before it enters the machine. The conveyor can be shut down immediately, and material inspected and removed if necessary.

G. AIS'S STORM WATER POLLUTION PREVENTION PROGRAM

The AIS property does not currently contribute contaminants to the ground water, with the exception of barium (which was detected at concentrations well below state and federal standards). To prevent surface and ground water contamination, AIS has in place a comprehensive storm water management program. Pursuant to its National Pollutant Discharge Elimination System/State Disposal System Permit No. MN G610000, AIS prepared in 1993 and has implemented a comprehensive Storm Water Pollution Prevention Program (SWPPP) plan which uses both structural and non-structural BMPs.

1. **Structural BMPs.** Installation of structures to reduce the containment pollutant is a key BMP in AIS's SWPPP. The major structural BMP is the used oil/coolant containment facility constructed in 1994. The facility initially consisted of a 4,000 square feet impermeable pad sloping into a tank collection area equipped with two 8,000 gallon capacity metal tanks. The metal tanks are placed inside a concrete vault, and the vault is equipped with leak detection and vapor detection systems. In 1995, AIS's added a 15,000 square foot bunkered area for storing metals awaiting recycling. This area also drains to the oil/coolant containment facility.

Captured oil and coolants from the containment facility are transferred to AIS's waste water treatment equipment in the red metal recycling building where the water fraction is evaporated. The remaining coolant/oil fraction is burned on-site in a space heating unit which heats the red metal recycling building. Calculations of potential to emit for the space heater (available on request) show this to be an insignificant source of emissions.

The only oil that leaves the AIS property is the small amount (less than 55 gallons/year) remaining after evaporation and cannot be burned in the space heater. This oil is tested and shipped in compliance with federal, state, and local hazardous waste and used oil regulations. AIS has filed a management plan with Hennepin County regarding the oil/coolant evaporation system.

As part of rehabilitating the shear, AIS has installed a new cement foundation with a curbed catchment area to trap any releases of hydraulic oil or other liquid pollutants or contaminants. The catchment area flows to a 55 gallon catchment device. AIS plans to install a similar system around the baler.

To guard against spills that might result from overfilling AIS's underground fuel tanks, AIS in 1994 installed a 29 feet by 14 feet concrete pad and curb around the refueling area. Storm water from this area is directed to a holding container.

2. **Non-Structural BMPs.** AIS also uses non-structural BMPs to avoid contamination of storm water runoff. These focus on source reduction and regular maintenance. The most important is the pollution prevention program described in Question 20.F. which keeps pollutants from entering the AIS facility. In addition, AIS has implemented numerous BMPs suggested by the United States Environmental Protection Agency and the Institute of Scrap Recyclers for metal scrap recycling operations.

H. PROJECT MITIGATION MEASURES

AIS proposes several mitigation measures to protect ground water against contamination. First, areas of the project site to be used for stockpiling raw materials and finished product will be covered with asphalt pavement to reduce seepage to the water table. Storm water runoff from these areas will be directed to the on-site detention pond. Second, all haul roads will be paved. Third, the Kondirator pollution control equipment will deposit collected wastes directly into enclosed shipping containers, thus minimizing the chance for soil contamination and leaching to ground water. Fourth, process wastes generated at the manual sorting stations will also be deposited directly into enclosed containers.

21. Solid Wastes; Hazardous Wastes; Storage Tanks

a. Describe the types, amounts, and compositions of solid or hazardous wastes to be generated, including animal manures, sludges and ashes. Identity the method and location of disposal. For projects generating municipal solid waste indicate if there will be a source separation plan; list type(s) and how the project will be modified to allow recycling.

A. PROCESS WASTES

The process wastes generated will be generally composed of ceramics, cloth, glass, leather, metallic fines, paper, plastics, rubber, wood and miscellaneous other components such as dirt. The wastes are collected in different forms called shredder fluff, sludge, particulates, and non-metallics.

1. **Cyclone Particulates.** The cyclone of the Kondirator Dust Collection System is designed to capture an estimated 1,600 pounds of particulate matter per hour of operation. The particulate dust will range in diameter from less than 10 microns to greater than 80 microns. Approximately 80 percent of the dust will have a diameter greater than 80 microns.

2. **Scrubber Effluent.** The venturi scrubber of the Kondirator Dust Collection System is designed to capture approximately 100 pounds of particulate matter per hour of operation. The dust will be collected in a 500 gallon per minute recirculating water stream. A heated, enclosed concrete settling pit with a capacity of 1,170 cubic feet is provided to collect the dust that settles out of the scrubber water. The particulate dust will range in diameter from less than 10 microns to 80 microns.

3. **Cascade Cleaning System Particulates.** The Cascade Cleaning System is designed to capture an estimated 3,900 pounds of particulate matter per hour. The dust will be collected by a recirculating air stream passing over the product at air speeds of approximately 12 ft/sec. A cyclone will remove and collect the waste material. Approximately 85 percent of the material will have a diameter greater than 1/2 inch and two percent of the material will have a diameter less than 40 μm.

4. **Manual Sorting Waste.** The non-magnetic fraction of the Kondirator output will be manually sorted to recover aluminum, red metals, and other recyclable components. The non-metallic waste remaining after sorting is estimated to be 9,718 pounds per hour.

5. **Total Waste And Disposal.** An estimated 887 tons per month, or 10,644 tons per year, of process solid wastes will be collected by the Kondirator Dust Collection System and the Cascade Cleaning System. This compares to current solid waste generation of 15-20 tons per month, or 180-240 tons per year.

   These wastes will be disposed of by local incineration or landfilling. AIS will consider Pine Bend Sanitary Landfill in Inver Grove Heights, McLeod Sanitary Landfill in Glencoe, and the USPCI facility in Rosemount as possible sites for landfilling.

B. HAZARDOUS WASTES

Given the waste composition identified above, AIS does not anticipate that any of the process wastes will be hazardous wastes. If required testing identifies a certain waste as hazardous, it will be disposed of in accordance with state and federal hazardous waste laws and regulations.

b. Indicate the number, location, site, and use of any above or below ground tanks to be used for storage of petroleum products or other materials (except water).

No tanks will be installed as a part of this project.

22. Traffic Parking spaces added __0__. Existing spaces (if project involves expansion) __N/A__. Estimated total Average Daily Traffic (ADT) generated __282 (1997)__. Estimated maximum peak hour traffic generated (if known) and its timing: __37 trips__, __(7-8 a.m.)__. For each affected road indicate the ADT and the directional distribution of traffic with and without the project. Provide an estimate of the impact on traffic congestion on the affected roads and describe any traffic improvements which will be necessary.

The analysis of traffic effects caused by the project is presented in the following sections:

A. Summary
B. Forecast Of Project Employment/Trip Generation
C. Traffic Forecasts
D. Assessment Of Transportation Impacts
E. Mitigation Measures

A. SUMMARY

The project when fully operational in 1997 will generate an estimated 282 trips[23] per day including 37 trips in the peak hour (7:00 to 8:00 a.m.). Combining these 1997 AIS trips with the other projected 1997 traffic in the vicinity of the AIS property does not cause a change in the level of service at any key intersections. Nor is surrounding street capacity adversely impacted.

Two impacts could occur. First, additional trucks might use 26th Avenue North to the west of I-94. This is a residential street not designated as a truck route. Second, the 28th Avenue North and Pacific Street North intersection could be adversely impacted by the additional truck traffic, since AIS's scale is located just off this intersection. The following mitigation measures would resolve these impacts.

- As to truck traffic on 26th Avenue North west of I-94, AIS should give truck drivers explicit instructions not to use this street, and the city should enforce its truck route designations.

- As to the intersection of 28th Avenue North and Pacific Street North: AIS should schedule as many truck deliveries as possible outside the peak period; AIS should instruct drivers not to enter or depart the AIS property from the north on Pacific Street; and the city should create a Truck Waiting area on the east side of Pacific Avenue North from the intersection with 28th Avenue North south to the first driveway. AIS intends to make this request of the city.

B. FORECAST OF PROJECT EMPLOYMENT/TRIP GENERATION

Employment forecasts and trip generation for the AIS property, including the project site, have been developed for the 1997 future conditions. The traffic forecasts and analyses have been prepared for 1997 because the Kondirator is expected to begin operation in the fall of 1996 and will be operating at full capacity in 1997. The employment and trip generation forecasts were based on the commodity tonnages described in Table 22.1 and the existing and future vehicle types and capacities described in Tables 22.2 and 22.3.

[23] A trip is defined as a vehicle which either goes to the AIS property or departs from the AIS property. Each round-trip to and from, or from and to, the AIS property, therefore, counts as two vehicle trips for traffic analysis purposes.

TABLE 22.1
AIS COMMODITY FORECASTS

Average Yearly Tons		
Use	**Existing**	**1997**
Kondirator	0	377,800[a]
Non-Kondirator	162,460	49,050
Total	162,460	426,850
Non-Kondirator 1997 Materials		
Type Of Material		**Tons**
Nonferrous		9,240
Stainless steel		2,677
Other		1,570
Turnings		13,459
Cast iron		22,104
Total		49,050

[a]The 377,800 tons for the Kondirator is conservative because it is the maximum annual processing volume.

TABLE 22.2
EXISTING YEARLY TONS AND VEHICLES

Direction	Vehicle	Tons Per Vehicle	Vehicle Quantity	Tons	Percent
Inbound	Barge	1,200	2		1.5
	Rail	60	35		1.3
	Truck	15.6	10,105		97.2
Total					100.0 percent
Outbound	Barge	1,250	40		30.8
	Rail	100	1,066		65.6
	Truck	20	293		3.6
Total					100.0

TABLE 22.3
1997 PROJECTED YEARLY TONS AND VEHICLES

Direction	Vehicle	Tons Per Vehicle	Vehicle Quantity	Tons	Percent
Inbound	Barge	1,200	2	2,400	0.6
	Rail	60	2,035	182,100	42.7
	Truck	10[a]	24,235	242,350	56.8
Total				426,850	100.1
Outbound Assuming Max. Barge Carriage At 50 percent	Barge	1,250	171	213,750	50.1
	Rail	100	2,071	207,100	48.5
	Truck	20	300	6,000	1.4
Total				426,850	100.0
Outbound Assuming Max. Rail Carriage At 60 percent	Barge	1,250	131	163,750	38.4
	Rail	100	2,571	257,100	60.2
	Truck	20	300	6,000	1.4
Total				426,850	100.0

[a]Conservative assumption because existing inbound trucks carry an average of 15.6 tons per vehicle.

1. **1997 Average Daily Truck Traffic Generation.** Based on Tables 22.1, 22.2, and 22.3, the next step was to determine the average daily truck traffic projections as follows:

   a. **Inbound trucks.**
   Average Yearly Inbound = 24,235 trucks
   Weekdays (estimated at 80 percent) = 19,388 trucks
   Weekends (estimated at 20 percent) = 4,847 trucks
   Therefore, Average Weekday Inbound Trucks = 19,388/260 days = 74.6.

   b. **Outbound trucks.**
   Average Yearly Outbound = 300 trucks
   Weekdays (estimated at 80 percent) = 240 trucks
   Weekends (estimated at 20 percent) = 60 trucks
   Therefore, Average Weekday Outbound Trucks = 240/260 days = 0.9.

   c. **Total average weekday truck trips.**
   Average Weekday Trucks: 75 + 1 = 76
   Since each truck makes one trip in and one trip out, average weekday truck trips = 76 x 2 = 152.

2. 1997 Weekday Peak Hour Truck Traffic Generation. The peak hour truck traffic forecasts have been established as follows:

   a. **Peak weekday tons.**

   Peak Kondirator operation at 100 tons/hour and 11 hours/day = 1,100 tons/day

Non-Kondirator commodities at 49,050 tons/year or 943 tons/week or 135 tons/day

Estimate that peak weekday volume for the non-Kondirator commodities doubles for the average weekday (2 x 135 = 270 tons)

Thus, Peak Weekday Tons = 1,100 + 270 = 1,370 tons

b. Peak weekday number of trucks. Table 22.4 develops the peak weekday truck traffic.

TABLE 22.4
1997 PEAK WEEKDAY TRUCK TRAFFIC

Direction	Yearly Percent By Truck	Peak Weekday Tons	Tons	Tons Per Vehicle	Peak Weekday Number Of Trucks
Inbound	56.8 %	1,370	778	10	78
Outbound	1.4 %	1,370	19	20	1
Total					79

c. Peak hour truck trips. Since each truck makes one trip in and one trip out, peak weekday truck trips = 79 x 2 = 158 trips. Using the estimate that 20 percent of daily truck trips occur during the peak hour, peak hour truck trips = 158 x 0.2 = 31.6, or 32 trips.

3. **Additional Factors Influencing Traffic Forecasts.** The following other characteristics of the subject development were used for further traffic forecast purposes:

- Current working hours at the AIS property are 7:00 a.m.-4:00 p.m., five days per week. The current 45 employees arrive before 7:00 a.m. and leave after 4:00 p.m. For purposes of evaluating the 1997 future impacts, the employment conditions are expected to include 20 new employees for the Kondirator, for a 1997 total of 65 employees. The 20 new employees will work three shifts: ten employees from 7:00 a.m. to 4:00 p.m., five employees from 7:30 a.m. to 5:00 p.m., and the remaining five employees from 1:00 p.m. to 10:00 p.m.

- All existing and future employees are expected to generate one inbound and one outbound trip per day.

- There is a broad range of inbound commodity types and quantities arriving at the AIS property, which results in a random pattern of truck types and capacities. Trucks can be processed through the AIS property in 15 minutes or less.

- Vehicular traffic counts do not experience an appreciable seasonal change. During winter months when barge traffic is not possible, the barge component of outgoing shipments will be made via rail and not by trucks.

- On-site roads are not presently blocked by rail cars. AIS has the ability to move rail cars on-site as necessary.

- The overall peak hour that has been identified as critical regarding potential impacts of the subject development on the public roadway system is 7:00 to 8:00 a.m. This hour is one of the two busiest hours of the day for AIS property operations, the other being 12:30 to 1:30

p.m. The typical peak hour for adjacent street traffic (about 4:30 to 5:30 p.m.) is an off-peak time for AIS. Some employee departures would occur during this hour, but no truck traffic. Based on a review of traffic counts on adjacent streets, it was determined that total post-development traffic volumes would be higher during the hour of 7:00 to 8:00 a.m. than from 12:30 to 1:30 p.m.

4. **Resultant Total Daily And Peak Hour Trip Generation.** The existing and future travel mode for all employees is single-occupant vehicles. No multi-occupant or other transit travel has been assumed. Truck trips inbound and outbound from the AIS property are considered as single-occupant vehicles for the existing and future conditions. The resultant 1997 trip generation forecasts are summarized in Table 22.5.

TABLE 22.5
TOTAL TRIPS GENERATED AT AIS IN 1997
INCLUDING PROJECT GENERATED TRIPS

	Average Daily Trips	**Peak Hour Trips**
Employees	130	5
Trucks	152	32
Totals	282	37

C. TRAFFIC FORECASTS

The purpose of this section is to define the traffic forecast methodologies and analysis which have been used as a basis for assessing the transportation related implications of the project site development.

Upon suggestion from the city staff, forecasts were developed for the area in the vicinity of the AIS property and for locations potentially impacted by the AIS property generated traffic. Streets and intersections which were analyzed are shown in Figure 22A.

1. **Traffic Forecast Methodology.** The methodology used in developing the traffic forecasts for the area described above involved the following major steps:

   - Establish existing daily and peak hour traffic.
   - Add trips to account for natural growth in other traffic from existing conditions to the 1997 future year.
   - Identify directional distribution of trips to and from the AIS property.
   - Add 1997 development trips to provide total post-development traffic volumes for the 1997 future condition.

2. **Existing Traffic Volumes.** Existing daily traffic volumes were obtained from the city of Minneapolis. The data provided was the 1991 average daily traffic volumes. As previously mentioned under Section 22.B.3., the hour of 7:00 to 8:00 a.m. has been identified as the peak hour for traffic forecast and analysis purposes. At each of the four key intersections shown in Exhibit 22A: Site Location And Key Intersections, turning movement volumes

were established based on traffic counts taken during the 7:00 to 8:00 a.m. peak hour on either September 30, 1993, or June 14, 1994. These volumes were very similar to counts previously conducted at these intersections in 1991.

3. **Future Baseline Traffic Volumes.** Baseline traffic volumes were established for 1997 to account for other growth (non-development traffic) on adjacent roadways. Based upon historical traffic counts from 1980 to the present and from discussions with city staff, a three percent annual volume growth factor was established.

   The existing 1993 and 1994 a.m. peak hour volumes and the existing 1991 daily traffic volumes were then increased by the three percent annual growth factor to develop the 1997 baseline traffic forecasts.

4. **Directional Distribution of AIS Property Traffic.** To develop valid traffic projections, an understanding of the directional distribution of traffic to and from the AIS property is needed. To this end, a survey of incoming trucks to the AIS property was conducted on September 6, 1991. Results of this survey are shown in Table 22.6. It is understood that current directional patterns are similar to those experienced in 1991. For purposes of the daily traffic forecasts, it is assumed that the employee traffic distribution will be similar to the truck distribution.

TABLE 22.6
DISTRIBUTION OF TRUCK TRIPS
TO AND FROM THE AIS PROPERTY

Route	Percentage
North on I-94	34
South on I-94	31
West on Lowry Avenue	1
East on Lowry Avenue	8
West on 26th Avenue	2
West on Broadway Avenue	0
East on Broadway Avenue	8
South on Wash. Ave./2nd St.	16
Total	100

5. **1997 Traffic Forecasts.** New trips generated by the proposed development were assigned to the roadway system in accordance with the trip generation projections from Section 22.B.4. and the trip distribution percentages from Table 22.6. These new trips were added to the 1997 baseline volumes as addressed in Section 22.C.3. The resultant existing and 1997 projected post-development daily and peak hour traffic forecasts are presented in Exhibit 22B: Existing And Projected 1997 Daily Traffic Volumes and Exhibit 22C: Existing And Projected 1997 A.M. Peak Hour Traffic Volumes.

D. ASSESSMENT OF TRANSPORTATION IMPACTS

This section is to analyze the transportation impacts on the roadway network, transit service, and parking needs. For the purpose of this analysis, it is understood that the truck scale is proposed to remain in its present location and that trucks will enter and exit the AIS property at this scale location. A discussion regarding the potential mitigation of any impacts identified is contained in Section 22.E.

1. **Impacts On Roadway Network.** The potential impact on the roadway network resulting from AIS property generated traffic consists of two general types:

- Impacts on streets adjacent to the AIS property.

- Impacts on nearby intersections in terms of capacity and level of service.

a. **Adjacent Streets.** A careful study was conducted to identify potential impacts on adjacent streets resulting from the development traffic. Specifically, the adjacent streets affected by the development and those which have direct access to and from the development are as follows:

- 28th Avenue North
- 26th Avenue North
- Pacific Street North
- Washington Avenue North/2nd Street North

In the area affected by AIS property traffic, it is important to note that a principal role of all the above streets is to serve industrial traffic. East of Washington Avenue North, 28th Avenue North, 26th Avenue North, and Pacific Street are used predominantly to provide access for local industrial uses, including significant truck traffic to/from other nearby facilities, as well as AIS. Implications of development traffic on the above referenced streets are presented next.

(1) ***28th Avenue North.*** 28th Avenue North terminates about 600 feet east of Pacific Street North. In that context, the segment east of Pacific Street functions just to provide access for the AIS property on the north side of 28th Avenue North and the city's solid waste transfer facility on the south side of the avenue. The proposed development will not alter the ability of this segment of 28th Avenue North to serve the two referenced land uses. Between Pacific Street and Washington Avenue, 28th Avenue North serves as a local industrial street. The volume of AIS truck trips using this street segment is expected to decline because, as mentioned in Section 22.E., directions will be given to truck drivers to approach the AIS property from the south on Pacific Street.

(2) ***Pacific Street North.*** This is a local industrial street which extends between 26th and 31st Avenues North. The usage of Pacific Street between 28th and 31st Avenues North by AIS traffic presently is quite low and is expected to remain low. Pacific Street between 26th and 28th Avenues North presently serves as an important approach and departure route. Truck drivers will be directed to use this route in the future, increasing the volume of AIS property trips. This increased usage is not expected to cause adverse impacts because Pacific Street is a local industrial street, and it has ample traffic capacity.

(3) ***26th Avenue North.*** The segment of 26th Avenue North between Washington Avenue and Pacific Street presently is an important route for trips to/from the AIS property and will serve a greater role in the future. Given its industrial character and width, this segment of 26th Avenue North is expected to adequately accommodate the projected traffic volumes. The 26th Avenue intersections at Washington Avenue and 2nd Street will be addressed in the next section. Approximately two percent of the AIS property

traffic potentially would use 26th Avenue west of I-94. It is assumed that these trips intend to proceed south on Lyndale Avenue or northwest on Broadway Avenue. 26th Avenue west of I-94 is not designated as a truck route and primarily serves the residential neighborhood. Truck trips on 26th Avenue west of I-94 would conflict with adjacent land uses.

(4) Washington Avenue North/2nd Street North. These two north-south streets function as major local roadways for the industrial area from Downtown north to Dowling Avenue. These major local roadways will adequately serve the forecasted AIS property traffic. The key intersections along Washington Avenue and 2nd Street will be addressed in the next section.

b. Nearby intersections. Traffic analyses for potentially affected intersections have been organized as follows:

- Analyses for following nearby intersections on major roadways:
  - Lowry Avenue North and Washington Avenue North
  - Lowry Avenue North and 2nd Street North
  - 26th Avenue North and Washington Avenue North
  - 26th Avenue North and 2nd Street North
- Analyses regarding I-94 freeway ramps at Dowling and Broadway Avenues.
- Analyses regarding intersection of 28th Avenue North and Pacific Street North.

Traffic forecasts for the four intersections first referenced above are presented in Figure 22C. Roadway geometrics, including individual lane widths and assignments, traffic control devices such as signal phasing and timing were obtained through field observations to provide a basis for the capacity analyses. Level of service analyses were conducted using the Highway Capacity Software and the All-Way Stop Controlled Intersection analyses.

Table 22.7 summarizes the results of these capacity analyses for the existing and future peak hour conditions. As can be noted from Table 22.7, the expected 1997 level of service at each of the four intersections analyzed will not change from existing conditions. Thus, it is concluded that traffic generated by the proposed development will not cause capacity constraints at these intersections.

TABLE 22.7
LEVEL OF SERVICE AT KEY INTERSECTIONS
DURING PEAK HOUR OF 7:00 TO 8:00 A.M.

Intersection	Existing	1997
Lowry/Washington Avenue[a]	B	B
Lowry/Avenue/2nd Street[a]	C	C
26th/Washington Avenue[a]	B	B
26th Avenue/2nd Street[b]	C	C

[a]Intersections controlled by traffic signals.
[b]Intersection controlled by a four-way stop. (This level of service indicates the worst condition of the four intersection approaches).

The next step is to analyze the effects of site generated traffic regarding the I-94 freeway ramps at Dowling Avenue and at Broadway Avenue. During the a.m. peak hour, site traffic would be expected to use the Broadway Avenue ramps only to proceed eastbound on I-94. Currently, this entrance ramp is controlled by a signalized ramp meter. The resultant queues stack back to Broadway Avenue. Based on the development trip generation and directional distribution for the 1997 future condition, an increase in 1-5 truck trips can be expected on this ramp. It is expected that this limited increase will not change the level of service on this entrance ramp, nor the queuing characteristics.

Regarding the Dowling Avenue interchange with I-94, the peak AIS inbound and outbound traffic volumes are not expected to conflict with peak Dowling Avenue ramp use. Therefore, no traffic impacts are expected at the Dowling Avenue ramps.

Next, it is important to address the traffic implications of the project on the intersection of 28th Avenue North and Pacific Street North. It is appropriate to address this intersection because the truck scale for the development (both existing and future) is located in the immediate northeast corner of the intersection. Most trucks are required to use the scale, and they do so both for their incoming and outgoing movements. To understand truck operations on the scale and through the intersection of 28th Avenue North and Pacific Street, a survey was performed during the a.m. peak period (6:45-8:15 a.m.) on Wednesday-Friday, September 18-20, 1991. All truck movements on and off the scale were recorded, and observations were made regarding the effects of truck maneuvers on overall traffic operations through the intersection of 28th Avenue North and Pacific Street North. During the a.m. peak hour (7:00-8:00 a.m.), the average number of truck movements on the scale was 18 (11 inbound and seven outbound). The a.m. peak hourly volume for the three days was 24 truck movements. The average duration of time in which a truck occupied the scale was one minute 15 seconds. The following observations were recorded:

- Usage of scale seemed to be on first come-first served basis. No apparent difficulty.

- When scale was occupied, incoming trucks stopped at various locations on adjacent streets, sometimes double parking. It should be noted that trucks to and from other nearby land uses have been double parking on adjacent streets.

- After entering the AIS property from 28th Avenue North, the rear end of some incoming trucks extended onto 28th Avenue North.

- After leaving the truck scale, most trucks would park in a parking space on a nearby street. The drivers then would walk from the truck to the AIS office to complete their paperwork.

- Upon leaving the scale, some trucks made a U-turn to proceed to the north on Pacific Street. Such U-turns interfered with traffic operation at the intersection of 28th Avenue and Pacific Street.

In the future the peak hour volume of trucks using the scale will increase primarily due to trips associated with the Kondirator. To provide effective traffic operation in the future, without adverse effects on the intersection of 28th Avenue and Pacific Street, three issues that need to be resolved are:

- Measures to provide adequate truck movement capacity on the scale and to effectively organize incoming and outgoing movements.

- Measures to provide adequate stacking space for incoming trucks so that they do not interfere with traffic movements on 28th Avenue or Pacific Street.

- Measures to minimize U-turn maneuvers between the scale and the north on Pacific Street.

Mitigation measures for the above three items are addressed in Section 22.E.

The preceding analyses have indicated that the proposed development on the AIS property will not adversely affect the level of traffic service at the intersections of Lowry Avenue/Washington Avenue, Lowry Avenue/2nd Street, 26th Avenue/Washington Avenue, and 26th Avenue/2nd Street. Also, this development would not impact the I-94 freeway ramps at Dowling Avenue and at Broadway Avenue. Mitigation measures (addressed in Section 22.E.) are needed to avoid negative impacts at the intersection of 28th Avenue and Pacific Street.

2. **Impacts On Transit.** Currently no employees use transit for trips to or from the AIS property. Usage of transit is not anticipated to change in the future.

3. **Impacts On Parking.** Two issues identified by city staff regarding parking were:

- Truck and trailer parking on and off the AIS property.
- Employee parking.

A review and analysis of the proposed site plan indicates there will be adequate parking areas to park all trucks and trailers on-site. Specifically, the new site road and areas along the Pacific Street frontage will be used for the truck/trailer parking needs.

Currently, employee parking occurs in three locations:

- 13 spaces located on-site adjacent to 28th Avenue south of AIS's main office building.
- Three spaces located on-site adjacent to the scale along Pacific Street west of the main office building.
- The remaining 29 employees park on-street along both sides of Pacific Street north of 28th Avenue.

The projected increase of 20 employees for the Kondirator operation will require 20 additional parking spaces. These additional employees are anticipated to park on-street along Pacific Street. With the truck/trailer parking proposed to occur on-site, adequate space will be available on-street for the additional employee vehicles.

E. MITIGATION MEASURES

1. **Roadway Network And Intersections.** AIS and the city should take steps to eliminate use of 26th Avenue Northwest of I-94 by trucks traveling to/from the AIS property. To accomplish this, AIS should give specific directions to drivers regarding routes to and from

the AIS property. Such directions should include avoiding use of 26th Avenue Northwest of I-94. And the city should enforce its truck route regulations to penalize trucks which use 26th Avenue Northwest of I-94.

Mitigation measures are needed to avoid negative effects at the intersection of 28th Avenue North and Pacific Street. As presented below, effective mitigation measures have been developed to resolve each of the three types of issues:

a. **Capacity for truck movements on scale and organizing of incoming and outgoing trucks.** AIS presently has in place and operates a traffic signal system to control inbound and outbound traffic coming onto the scale. This system, which is controlled by the scale operator, consists of red and green lights facing traffic that would enter the scale both from the north and south. The operator can display a red signal to one direction and a green signal to the other. Two other measures that AIS should implement to assist in expediting movements across the scale are:

   - Schedule numerous truck deliveries to arrive at varying times outside the peak period.
   - During peak periods when the scale is heavily used, a staff person should be assigned to work with truck drivers and the scale operator to expedite movements on and off the scale.

b. **Measures to provide adequate staging for incoming trucks.** When incoming trucks arrive at the AIS property, a staging location is needed where they can wait before being directed onto the scale. Presently, some trucks double park or otherwise stop in a traffic lane, both of which interfere with traffic operation on 28th Avenue North and Pacific Street. Two measures which should be implemented to resolve this situation are:

   - Direct all trucks to approach the AIS property from the south on Pacific Street and not to enter from the north on Pacific Street or the west on 28th Avenue.
   - Prohibit parking on the east side of Pacific Street between 28th Avenue North and the first driveway to the south (approximately 200 feet). Convert this curb space to "Truck Waiting" only. For example, if a truck driver coming to AIS from the south on Pacific Street sees the red light on for the scale, the driver could pull over to this east curb of Pacific Street to wait until the green signal is given. This Truck Waiting space would avoid interference with traffic flow on 28th Avenue North and Pacific Street. Observations indicate that ample on-street parking is available in nearby locations to replace the six parking spaces which would be removed along the east side of Pacific Street between 28th Avenue North and the first driveway to the south. If necessary, an exterior mirror should be provided at the scale so that the scale operator can effectively see incoming trucks in the Truck Waiting space.

c. **Measures to avoid U-turns between the scale and the north on Pacific Street.** Truck drivers should be given explicit instructions not to enter the AIS property from the north on Pacific Street nor depart in that direction.

2. **Transit.** No mitigation measures are needed.

3. **Parking.** No mitigation measures are needed.

23. **Vehicle-related Air Emissions Provide an estimate of the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts.**

Based upon the traffic analysis in Question 22, the increase in the number of average daily employee trips at the AIS property due to the project is small - 40 trips per day. The average increase in the total number of daily truck trips is 45 trucks per day. The traffic volumes projected in Question 22 have been used to estimate carbon monoxide (CO) levels near the most critical intersections in 1993 (no project) and 1997 (with the project). MOBILE 5A emissions derived for the Twin Cities Metropolitan Area by the Minnesota Department of Transportation in conjunction with the CAL3QHC dispersion model were used to estimate CO concentrations on the sidewalk at the four corners of each intersection. The highest predicted concentrations are shown in Table 23.1.

Also shown in Table 23.1 are assumed background concentrations for 1-hour and 8-hour time periods. These levels are derived from the second highest concentrations observed in 1992 and 1993 at the MPCA continuous monitoring site 949 located at 1829 Portland Avenue. This is assumed to represent background concentrations in the general vicinity of the Minneapolis Central Business District.

TABLE 23.1
PREDICTED CARBON MONOXIDE CONCENTRATIONS
NW CORNER OF INTERSECTIONS

Intersection	**Traffic CO (ppm)**					
	Modeled 1-Hour	**Estimated 8-Hour**[a]	**1-Hour**	**8-Hour**	**1-Hour**	**8-Hour**
Lowry/Washington -	5.2 5.5	3.6 3.8	3.0 3.0	2.0 2.0	8.2 8.5 (+0.3)	5.6 5.8 (+0.2)
Lowry/2nd St. N. -	6.1 6.4	4.3 4.5	3.0 3.0	2.0 2.0	9.1 9.4 (+0.3)	6.3 6.5 (+0.2)
26th/Washington -	4.3 4.4	3.0 3.1	3.0 3.0	2.0 2.0	7.3 7.4 (+0.1)	5.0 5.1 (+0.1)
26th/2nd St. N. -	4.3 4.7	3.0 3.3	3.0 3.0	2.0 2.0	7.3 7.7 (+0.4)	5.0 5.3 (+0.3)
MPCA Standards					**30.0**	**9.0**

[a]8-hour assumed to be .70 of PM Peak Hour

From Table 23.1 it can be seen that the overall 1-hour concentrations are well below the 30 ppm 1-hour standard. The overall 8-hour concentrations are also well below the 9 ppm 8-hour standard. Increases in concentration from project traffic for the 1-hour and the 8-hour periods are expected to be below 1 ppm. The increase in emissions of hydrocarbons, sulphur oxides, nitrogen oxides, and particulates from the additional employee vehicles and trucks each day are expected to be of the same order of magnitude as CO. Thus, no significant adverse impact on vehicle emissions and related air quality is expected from the project.

24. Stationary Source Air Emissions Will the project involve any stationary sources of air emissions (such as boilers or exhaust stacks)? ■ **Yes** ☐ **No**

If yes, describe the sources, quantities, and composition of the emissions; the proposed air pollution control devices; the quantities and composition of the emissions after treatment; and the effects on air quality.

The description of stationary source air emissions is presented in the following sections:

A. Summary
B. Composition Of Emissions
C. Air Pollution Controls
D. Effects On Air Quality
E. Project Mitigation Measures

A. SUMMARY

Installation of the Kondirator will result in point source air emissions from the pollution control equipment and fugitives from raw material unloading onto the storage area and loading into the Kondirator. Delivery of final product to the final product storage area and loading of final product onto barges and rail cars is not expected to generate significant fugitive emissions due to the air scrubbing of the final product by the Cascade Cleaning System. Ambient air quality impacts will consist of particulate emissions from the above sources.

Modeled ambient air particulate concentrations (including background concentrations) resulting from Kondirator emissions do not exceed the National Ambient air Quality Standards (NAAQS) for particulate matter 10 microns and smaller (PM_{10}). Total suspended particulate (TSP) concentrations resulting from Kondirator emissions do not exceed primary or secondary Minnesota Ambient Air Quality Standards (MAAQS) for TSP. This is true even though TSP background concentrations in this area are very high, representing 87 percent of the annual secondary MAAQS and 81 percent of the 24-hr secondary MAAQS. Modeling results are summarized Table 24.1 below.

TABLE 24.1
SUMMARY OF PARTICULATE MODELING

Pollutant	Modeled Ambient Conc. μ/m³	Background Ambient Conc. μ/m³	Total Ambient Conc. μ/m³	NAAQS Primary μ/m³	NAAQS Secondary μ/m³	MAAQS Primary μ/m³	MAAQS Secondary μ/m³
PM_{10}							
Annual	1.1	21.1	22.2	50	50		
24-hr	10.1	49	59.1	150	150		
TSP							
Annual	3.2	42	45.2			75	60
24-hr	26.5	(107.0	133.5)			260	150

B. COMPOSITION OF EMISSIONS

1. **Particle Size Distribution.** Information on the size of particles emitted from the pollution control devices of the Kondirator are based on studies completed by the pollution control equipment vendor on other metal shredding systems similar to the Kondirator, as no information on particle size or metal speciation in emissions from operating Kondirator equipment has been made available to the MPCA. Mass balances have shown that 75 percent of the particulate generated in metal shredders is 0.5 inches or greater. The size distribution of the remainder is estimated based on samples collected from similar cyclone emission stacks. The individual particle size distributions and pollution control capture efficiencies are presented in below in Part C.1., Table 24.2 for the Kondirator Dust Collection System and in Part C.2., Table 24.3 for the Cascade Cleaning System.

   The capture efficiency of a cyclone is determined by the geometry of the cyclone and the diameter of the particle. A given cyclone will have specific capture efficiencies for specific particle diameters. Tests conducted on the exhaust gas from similar cyclones operating on similar shredders have established the size distribution of particles emitted from the cyclone. The theoretical efficiencies at each range of particle diameters as reported in Table 24.3 have been used to predict the particle size distribution of the effluent stream.

2. **Dust Composition.** The dust that will be emitted from the Kondirator is estimated to be composed of the same constituents as the raw material metals. The composition of the these metals is assumed to be characterized by the composition stated in the product MSDS. The MSDS Development Process is described in a technical paper entitled *Hazard Determination Process*, written by Resource Consultants, Inc. (RCI). RCI prepared MSDS sheets for 24 major commodities handled by scrap recyclers. The constituents were developed by a review of analytical data gathered through research on the wastes from scrap materials, MSDSs from manufacturers of the original materials, and process and industrial hygiene references.

   The proposed Kondirator is projected to produce a number of recycled scrap products, including carbon steel, galvanized steel, cast iron, stainless steel, and aluminum. An estimated 90 percent of the product will be carbon steel scrap. The remaining products will each constitute less than two percent of the total product. A preliminary screen was conducted to identify which of the constituent products contain quantities of hazardous substances in quantities that might present a potential hazard by the Toxicity Characteristic Leaching Procedure (TCLP). This screening procedure identified that stainless steel and aluminum scrap presented the greatest potential hazard.

   An estimate of the worst case potential composition was developed using a weighted composition of two percent stainless steel; two percent aluminum; one percent (total) iron, cast iron, copper, brass, and galvanized steel; five percent nonmetallic scrap; and 90 percent carbon steel; and is presented in Table 18.2. The constituents of these products were compared to the lists of pollutants of concern associated with the Toxicity Characteristic Leaching Procedure, the U.S. Clean Air Act, and the Minnesota Air Toxics Review Guide. The constituents that were listed as pollutants of concern by any of these three programs were set at their maximum percent composition. The levels of the unlisted constituents were assumed to be equal to their MSDS reported concentration and then normalized downward to complement the levels of listed constituents.

C. AIR POLLUTION CONTROLS

1. **Kondirator Dust Collection System.** The particulate emissions that are released in the fragmentizing station of the Kondirator are controlled by a two-stage dust extraction system consisting of a cyclone separator operating in series with a Venturi scrubber. The fragmenter is fully enclosed except for the intake and discharge openings. The cyclone separator creates negative air pressure within the fragmenter, which prevents the release of emissions at the intake or discharge openings.

   At the design capacity of 100 TPH, the Kondirator is estimated to produce 1,714 lb/hr of particulate dust. This dust loading rate is based on an estimated mass loading of 5.0 grains per cubic foot and an air displacement of 40,000 cubic feet per minute. According to the air pollution control equipment vendor, Osborn Engineering (technical memorandum, 7/5/89), an estimate of 0.2 grains per standard dry cubic foot is the industry standard estimate of the grain loading produced by a hammer mill shredder. The loading is also based on the cubic feet of air displaced by the shredder as it rotates. From the dimensions of the AIS Kondirator, the shredder displacement is estimated to be 20,042 cfm at a fan efficiency of 0.3. Safety factors have been applied to the value calculated using the industry standard value and the calculated displacement to arrive at the estimated dust loading rate.

   In the first stage of the dust extraction system, contaminated air is collected at the discharge point of the fragmenter through a pressure relief vented hood. Particulates and air are drawn through ducting to a high efficiency primary cyclone. The cyclone consists of a cyclone body, surge hopper, support structure, and discharge plenum. The cyclone separator removes coarse dust and waste by centrifugal separation. The primary cyclone will collect approximately 1,608 lb/hr for an efficiency of 93.8 percent averaged over all particle sizes. The cyclone will discharge approximately 106 lb/hr of dust to a high pressure Venturi scrubber. The scrubber cleans the air by drawing the dust laden air into a water spray. The inertia of motion of the particles causes them to collide with water droplets and be adsorbed. The scrubber will capture approximately 100 lb/hr or 94.1 percent of the dust that enters, and discharges an estimated 6.1 lb/hr. The combined result of the two-stage dust extraction system is a capture efficiency of 99.6 percent. The capture efficiencies are presented in Table 24.2.

TABLE 24.2
ESTIMATED EMISSIONS FROM THE KONDIRATOR DUST COLLECTION SYSTEM[a]

Particle Size (microns)	Size Distribution (percent)	Cyclone Efficiency (percent)	Cyclone Capture (lb/hr)	Cyclone Discharge (lb/hr)	Scrubber Efficiency (percent)	Scrubber Capture (lb/hr)	Scrubber Discharge (lb/hr)
> 80	75	100.00	1,285.5	0.0	100	0.0	0.0
40-80	5	93.58	80.2	5.5	100	5.5	0.0
20-40	10	81.42	139.6	31.8	98	31.2	0.6
10-20	5	67.10	57.5	28.2	95	26.8	1.4
< 10	5	53.02	45.4	40.3	90	36.2	4.0
Total	100	93.83	1,608.2[b]	105.8	94	99.7[b]	6.1

[a]Assumed inlet loading is 1,714 lbs/h.
[b]Overall efficiency of the two stage system = (1608.2 lbs + 99.7 lbs) / 1,714 lbs = 99.6 percent.

2. **Cascade Cleaning System.** The particulate emissions that are generated in the process of cleaning the product are controlled by the Cascade Cleaning System. The dust laden air from the zig-zag sifter (classifier) and from the sieving drum is cleaned by this system. This system uses a cyclone to remove the particulates. The separated particulate material drops from the cyclone into a bin with a rotary valve. The valve provides an air lock for the cyclone and permits the waste to be continuously discharged at a controlled rate to the collection bin. The waste loading rate to the Cascade Cleaning System is calculated from the amount of nonmetallic material, or waste, in the system. The composition of the input materials is estimated to be 90 percent ferrous metal, five percent nonferrous metal, and 5 percent nonmetals or waste. The ferrous product is estimated to be 99 percent ferrous metal and one percent nonmetal. The nonferrous product is estimated to be 70 percent nonferrous metal and 30 percent nonmetal. A mass balance on the nonmetal results in an estimated maximum waste loading to the cleaning system of 3,896 pounds per hour. These results are presented in Table 24.3. This estimate is believed to be conservative because part of the waste will be removed at the manual sorting stations and will not actually present a load to the pollution control system.

TABLE 24.3
ESTIMATED MAXIMUM WASTE LOADING TO CASCADE CLEANING SYSTEM[a]

Material	Input		Product Composition				Waste To Cascade	
Type	(percent)	(lb)	Ferrous (percent)	Ferrous (lb)	Non-ferrous (percent)	Non-ferrous (lb)	(percent)	(lb)
Ferrous	90	180,000	99	180,000	0	0	0	0
Non-ferrous	5	10,000	0	0	70	10,000	0	0
Waste	5	10,000	1	1,818	30	4,286	100	3,896
Total	100	200,000	100	181,818	100	14,286	100	3,896

[a]Assumed inlet loading of 100 TPH

The cyclone operates with a recycle stream to boost the total efficiency of the system. Ninety percent of the discharge from the cyclone is recycled back to the inlet of the Cascade Cleaning System. The method for calculating the capture efficiency for the system was proposed by Osborn Engineering in a 1/15/91 technical memorandum. The cyclone outlet is designed so that the discharge to atmosphere will be ten percent of the total cyclone discharge volume and will have a particle density of 50 percent of the recycle stream. As in the Kondirator cyclone, the efficiency of the Cascade Dust Collection cyclone varies with particle size. The total emissions from the cascade cleaning dust collection system are estimated to be 3.88 pounds per hour. The individual particle size distributions and capture efficiencies of the Cascade Cleaning System are presented in Table 24.4.

TABLE 24.4
ESTIMATED EMISSIONS FROM THE CASCADE CLEANING SYSTEM[a]

Particle Size (microns)	Cyclone Efficiency (percent)	Size Distribution (percent)	Amount Generated (lb/hr)	Cyclone Inlet (lb/hr)[b]	Cyclone Captured (lb/hr)	Cyclone Outlet (lb/hr)	Amount Recycled (lb/hr)	Amount Emitted (lb/hr)
>500,000	100.00	85.0	3,311.6	3,311.6	3311.6	0.0	0.0	0.00
40-500,000	89.00	13.0	506.5	565.8	503.5	62.2	59.3	2.96
30-40	83.83	1.5	58.4	69.1	57.9	11.2	10.7	0.53
< 30	70.00	.5	19.5	27.3	19.1	8.2	7.8	0.39
	99.90	100.0	3,896.0	3,973.7	3,892.1	81.6	77.7	3.88

[a]Assumed waste loading to cyclone = 10,000 - 1,818 - 4,286 = 3,896 lb/hr.
[b]Cyclone Inlet total = Amount Generated + Amount Recycled.

3. **Overall Pollution Controls Collection Efficiency.** The efficiency of the total system is calculated from the total waste loading of 1,714 + 3,896 = 5,610 pounds per hour and the total collection of 1,606 + 100 + 3,892 = 5,598. This gives a total system collection efficiency of 99.8 percent.

It was noted by several commenters that the method to derive the loading to the cyclone on the Cascade Cleaning System was not a true mass balance, in that it assumed no losses through the hammer mill. A second derivation of that loading is provided below, using a more formal mass balance approach.

A feed rate of 100 T/hr or 200,000 lbs/hr, consisting of 90 percent iron (180,000 lbs/hr Fe), five percent other metals (10,000 lbs/hr Me) and five percent other material (10,000 lbs/hr Other). Loading to the Kondirator Dust Collection System consists of 1,714 lbs/hr, including 1,543 lbs/hr iron (Fe), 86 lbs/hr other metals (Me) and 85 lbs/hr other materials. This leaves as feed to the Cascade Cleaning System a total of 198,286 lbs/hr, consisting of 178,457 lb/hr iron (Fe), 9,914 lbs/hr other metals (Me), and 9,915 lbs/hr other materials.

Using the same assumptions regarding loading to the Kondirator cyclone, a concentration of 5 gr/dscf is assumed (industry standard normal loading anticipated at 0.2 gr/dscf, and a safety factor of 25), with an air flow rate of 80,000 cfm. (Note that while only 8,000 cfm are discharged to the air, the cyclone actually "sees" 80,000 cfm, because 90 percent of the air is recycled through the Cascade Cleaning System.) This would result in a loading to the Cascade Cleaning System cyclone of 3,428 lbs/hr, consisting of 3,085 lbs/hr iron (Fe), 172 lbs/hr other metals (Me), and 171 lbs/hr of other materials. Note that this compares well with the original estimate derived above - 3,896 lbs/hr. The original estimate is higher, which provides a more conservative approach to the modeled impacts and risk assessment. See Questions 25 and 31.

Assuming 3,428 lbs/hr are sent to the Cascade Cleaning System, this leaves a total of 194,858 lbs/hr to product sales, consisting of 175,372 lbs/hr iron (Fe), 9,742 lbs/hr other metals (Me), and 9,744 lbs/hr other material. This mass balance results in a very conservative estimate of the amount and composition of materials discharged to the atmosphere. The real situation will result in higher concentrations of other materials (plastic, paper, dirt, paper and other materials) and fewer metal fines. Thus, given the assumptions used in the risk analysis, it is possible that the deposition of particular compounds and estimated risk to humans and the environment may have been overestimated. See Questions 25 and 31.

This analysis is further documented in technical data produced by the company and checked by MPCA staff. This material may be reviewed at MPCA on request.

4. **Achieving And Maintaining Air Pollution Control Equipment Efficiencies.** During the risk assessment process, a concern was raised that: "the air pollution control equipment efficiencies have not been scientifically demonstrated to be achievable and maintainable" by AIS and specifically that "the wet scrubber may lose efficiency in very cold weather." Each of these concerns is addressed below.

   a. **Control efficiencies achievable.** The control efficiencies presented by AIS are published control efficiencies provided by Osborn Engineering the vendor of the equipment. Where facilities have not yet been constructed, it is typical and customary to use such vendor supplied efficiencies.

      In this context, the achievement and maintenance of air pollution control equipment efficiency is a **risk** issue rather than a **permitting** issue. The distinction is important because it must be understood that the projected emissions from the Kondirator are fully in compliance with the limits specified for such sources in MPCA's air quality rules. The dust collection efficiency projected by the applicant (in this case, 99.8 percent) is more than acceptable from a permitting standpoint, because it limits particulate emissions to a level well below **permitting** requirements. Other things being equal, this would end the discussion.

      However, other things are not equal. The risk assessment required for this project, (summarized in item 31) which used AIS's projected emission levels as the basis for its calculations, determined that, at this particular site with its particular meteorological and receptor characteristics, potential human health and ecological risk resulted from those emission levels, even at that very high level of efficiency. This means that, at the very least, any loss of efficiency, which could make the risk worse, is potentially problematic. The problem is, if efficiency drops from 99.8 percent to 99.6 percent, the volume of emissions doubles, thereby doubling the calculated risk. This makes it very important that efficiency be documented to the maximum extent possible in this case.

   b. **Control efficiencies maintainable.** Both cyclones and scrubbers for the project are generally equipped with operational monitoring devices (e.g., pressure drop sensors, water flow or water temperature sensors) that show the operator how the control equipment is operating. Most vendors provide a recommended range of operation for pressure drop and flow or temperature, in order to protect the equipment and permit its efficient operation. Most air quality permits require a performance test to record the operational parameters that are observed during a performance test, and require the operator to stay either above a minimum level, below a maximum level, or between a minimum and a maximum level.

AIS plans to install pressure drop sensors on the cyclones, and either pressure drop sensors or water flow or water temperature sensors on the scrubber. In the event that the sensors show pressure drop, water flow, or water temperature are outside of the manufacturer's recommended range, the operator can inspect the equipment, and effect repairs or shut down the system to repair the equipment. So long as the operational parameters remain within the manufacturer's recommend range, the control equipment should perform as specified. It will be the responsibility of AIS to maintain control efficiencies and will be able to demonstrate that to the MPCA and the public.

c. **Winter operation of scrubbers.** There are several metal shredding operations in the northern part of the United States and in Canada that employ scrubbers of one type or another and which are exposed to freezing temperatures. No information has been made available to MPCA regarding whether scrubber efficiency is lower at these facilities. There are at least two ways in which efficiency in such circumstances may be degraded:

1) flow of water to the scrubber could freeze, thus reducing efficiencies; or

2) colder water could be less efficient in removing particulate matter.

With regard to freezing, scrubbers are designed in cold climates to prevent freezing of critical components. To not do this risks damage to equipment and failure of pollution control resulting in air quality violations. The main parts of the scrubber will not likely freeze, as the air from the hammer mill is at least 40 °F above ambient. With a constant supply of relatively warm and moving air, the scrubber itself is unlikely to actually freeze. The scrubber can also be insulated to further reduce the chance of freezing, if this is deemed to be necessary.

Since the scrubber will shut down daily during non-operational hours, it is designed to gravity drain to the settling pit, thus emptying the scrubber of water and eliminating freezing. The settling pit will be dug into the ground and covered and the recirculating pump will be located in the settling pit under water. Osborn Engineering has used this design successfully in Denver, Colorado, and Milwaukee, Wisconsin. The supply and return lines from the pumps to the scrubber and back will be insulated to prevent freezing. As with the scrubber itself, these lines are gravity drained in the event of a shutdown to prevent freezing.

Finally, the pressure drop or water flow or temperature sensors will alert the operator if freeze-ups should occur, and steps can be taken to thaw out the frozen portion and prevent further freezing. This would constitute an upset condition that may require a shutdown of the Kondirator, since the air pollution control equipment would not be operating properly.

With regard to reduced efficiency due to colder air and or water, this is not a concern for particulate matter removal. While scrubbers that rely on chemical reaction, (e.g., sulfur dioxide scrubbers) may lose efficiencies during colder weather because the chemical reactions between the sulfur dioxide and the scrubbant slow down at lower temperatures), this is not the case with particulate matter removal. Particulate matter removal is a physical, not a chemical process, depending only upon the flow of water, the flow of air, and the quantity of particulate matter in the air. There is no change in these parameters when the weather gets colder. Thus, there should be no concern for loss of efficiency in cold weather.

D. EFFECTS ON AIR QUALITY

Ambient air concentrations of particulates emitted from the Kondirator and associated operations were estimated using the Industrial Source Complex-Short Term (ISC2ST) dispersion model. Maximum 24-hour, and average annual concentrations of both particulate matter of 10 microns or less (PM_{10}) and total suspended particulates (TSP) were estimated using hourly meteorological data collected at the Minneapolis-St. Paul office of the National Weather Service (NWS) for the years 1987-1991. Upper air data and surface temperatures collected at the St. Cloud, Minnesota office of the National Weather Service for the period 1987-1991 were used to calculate mixing heights.

Two primary sources of emissions were modeled: stack emissions from the Kondirator Dust Collection System and the Cascade Cleaning System; and fugitive emissions from raw material handling.

1. **Stack Emissions.** Stack parameters stated in the April 1991 MPCA Air Emission Facility Permit Application prepared by HDR Engineering and shown in Table 24.5 were used in the modeling.

TABLE 24.5
STACK PARAMETERS

	Kondirator Dust Control Stack	**Cascade Cleaning System Stack**
Stack Height (feet)	62	60
Stack Diameter (inches)	42	24
Stack Flow Rate (acfm)	35,300	7000
Stack Temperature (Fahrenheit)	68	68

Particulate emission rates for the Kondirator Dust Control System stack and the Cascade Cleaning System stack were developed using data presented in Table 2 of the December 1990 MPCA Air Emission Facility Permit Application and information provided by Osborn Engineering regarding the pollution control equipment efficiencies. Based on this information, the emission rates shown in Table 24.6 were used in the modeling.

TABLE 24.6
EMISSION RATES

Particle Size (microns)	Kondirator Dust Control System Stack Emission Rate (lb/hr)[a]
>80	0.0
40-80	0.0
20-40	0.6
10-20	1.4
<10	4.0
Total	6.1
Particle Size (microns)	**Cascade Cleaning System Stack Emission Rate (lb/hr)[a]**
>500,000	0.0
40-500,000	2.96
30-40	0.53
<30	0.39
Total	3.88

[a] Based on throughput of 100 tons per hour.

Using the particle size distributions presented above, PM_{10} was modeled assuming emission rates of 4.0 lb/hr and 0.39 lb/hr, respectively, for the Kondirator Dust Control System stack and the Cascade Cleaning System stack. TSP was modeled assuming emission rates of 6.1 lb/hr and 3.88 lb/hr, respectively, for the two stacks. The modeling analysis conservatively considered PM_{10} to encompass all particles smaller than 30 microns emitted from the Cascade Cleaning System. Furthermore, the analysis did not account for scavenging as a result of deposition; that is, the modeling assumed that not particulates fell to the ground as the wind blew the dust away from the machine, and as a result assumed that modeled receptors (some across the river) were subjected to the total emissions from the equipment. In reality, given the specific gravity of any metallic particulates emitted, ambient concentrations would be less than the model predictions due to removal of particulates by gravitational deposition.

2. **Fugitive Emissions.** Fugitive emissions could come from the truck hauling, the raw material handling process at the project site, transfer of material within the operating machinery, disposal of waste material from the process, and handling of finished product. Only the raw material handling process is addressed as a source of fugitive emissions. Fugitive emissions from other Kondirator processes will be controlled and were not modeled. Several design features of the proposed Kondirator specifically address fugitive emissions control after raw material handling. First, all haul roads will be paved. Second, all conveyors associated with the Kondirator will be covered to prevent materials from falling or blowing off the conveyors. Third, all waste materials are placed directly into enclosed containers. Fourth, scrap metal running through the Kondirator is subjected to induced air velocities on the order of 100 feet per second. Typical wind speeds in the Minneapolis-St. Paul area are on the order of 15 feet per second. Particulate matter created or adhered to

the raw scrap metal will likely be removed by the pollution control equipment rather than winds blowing across conveyors. Fourth, dust will be controlled by street sweeping and watering. See Question 24.E. Thus, emissions are not expected from finished product handling.

Raw material handling, i.e., unloading raw materials from trucks and train cars to the raw material storage area and loading raw material from the raw material storage area to the Kondirator infeed belt, will release particulates. The phases of this handling process were modeled as area sources. Parameters used to model this source are presented in Table 24.7.

TABLE 24.7
FUGITIVE EMISSION MODELING PARAMETERS

Process	**Effective Release Height (ft)**	**Height of Volume Center (ft)**	**Area (sq ft)**
Raw material handling	25	12.5	2,500

Note that the raw material handling area is markedly smaller than the raw material storage area referenced in the answer to Question 6.G. The reason for this difference is that fugitive emissions will occur only from the raw material handling operations, as opposed to the entire storage pile. The area of the storage pile actively involved in raw material handling has been estimated to be 1,076 square feet, approximately seven percent of the storage area.

The average effective release height was developed by review of plans for the Kondirator and associated processing equipment. Release heights were chosen to represent the maximum height from which product would be dropped during a given process. The dimensions of each modeled area source were chosen to encompass a representative work area for each process at a given point in time.

The PM_{10} and TSP emissions from raw material handling were estimated assuming a processing rate of 100 tons of scrap metal per hour, an 11-hour work day, a mean wind speed of 10.6 miles per hour (based on 48 years of climatological data from the Minneapolis-St. Paul Airport), and a moisture content of one percent (based on assumed moisture content of 20 percent for the five percent raw material considered to be non-metallic and potentially moisture-bearing). Other assumptions included emission factors of 0.0012 lb/ton for PM_{10} and 0.0024 lb/ton for TSP (Factor Information and Retrieval System, Versions 2.62, U.S. Environmental Protection Agency (EPA), April 1994). These emission factors were developed for ore loading, and were used because no emission factors for shredders have been developed. The calculated fugitive emission rates for raw materials handling is presented Table 24.8.

TABLE 24.8
FUGITIVE EMISSION RATES

Process	**PM_{10} Emission Rate (lb/hr)[a]**	**TSP Emission Rate (lb/hr)**
Raw material handling	0.120	0.24

3. **Modeling Total Fugitive Emissions.** Given the emission rates, modeling was undertaken to estimate particulate concentrations.

The proposed noise walls were identified as structures potentially inducing downwash from the Kondirator Dust Control System stack and the Cascade Cleaning System stack. The integral wall adjacent to the Kondirator was evaluated as a structure two feet wide, 33 feet high, and 87 feet long. The free standing wall along the riverbank was evaluated as a structure two feet wide, 30 feet high, and 370 feet long. Direction specific downwash data were calculated for use in the modeling analysis.

Model receptors were established on a Cartesian coordinate system with the origin specified at the Kondirator dust control system stack. The regular coordinate system consists of x-axis coordinates(feet) at +/-305, +/-400, +/-500, +/-600, +/-700, +/-800, +/-900, +/-1000. The y-axis coordinates (feet) are specified at 0, +/-100, +/-200, +/-300, +/-400, +/-500, +/-560, +/-700, +/-800, +/-900, +/-1000. Discrete receptors were specified along the west bank of the Mississippi River for the length of the AIS property. These receptors were all specified with a x-axis coordinate (feet) of +125, and y-axis coordinates (feet) of 0, +/-100, +/-200, +/-300, +/-400, +/-500, +/-600, +700. All receptors were specified at ground level with flat terrain and a base elevation of 0.00 feet.

Estimated concentrations were calculated using the Urban Mode-3 dispersion coefficients. The following regulatory defaults were selected by invoking the regulatory default option: final plume rise used at all downwind receptor locations; stack-tip downwash effects included; buoyancy-induced dispersion effects parameterized; default wind profile coefficients assigned; a calm processing routine used to handle concentrations during calm periods; default vertical temperature gradients assigned; revised building wake effects procedure selected, invoking either the Huber and Snyder method or the method of Schulman and Scire depending on stack and building dimensions. As stated above, gravitational settling categories were not selected in order to conservatively estimate ambient air concentrations of particulates.

Background TSP and PM_{10} concentrations were developed using ambient air monitoring data obtained from the MPCA for the years 1989 through 1993. MPCA site #0940 located at 143 13th Avenue Northeast is the ambient air monitoring station located nearest the AIS site. TSP data are collected at this station. The nearest PM_{10} station is MPCA site #0907 located at 4646 Humboldt Avenue North. The ratio of PM_{10} to TSP at 4646 Humboldt Avenue North was calculated as 0.458 using the average ratio calculated for the four most recent years of data available (1985 through 1988) when both PM_{10} and TSP were measured. This ratio was used to project PM_{10} concentrations at 143 13th Avenue Northeast based on measured TSP at the site. The highest annual PM_{10} concentration was calculated from annual TSP concentrations for 1991 through 1993. A value of 21.1 $\mu g/m^3$ (TSP concentration of 46 $\mu g/m^3$, 1991 annual arithmetic mean) was estimated as representative of an annual PM_{10} concentration at the AIS site. The appropriate annual background TSP concentration is the annual geometric mean. The highest annual average concentration at 143 13th Avenue Northeast was 42 $\mu g/m^3$, 1991 annual geometric mean.

A 24-hour PM_{10} background concentration was estimated using the sixth highest 24-hour TSP concentration recorded during the three-year period 1991 through 1993 at 143 13th Avenue Northeast and multiplying by the PM_{10} to TSP ratio of 0.458. The highest second highest TSP concentration was 107 $\mu g/m^3$ (1990). The corresponding highest second highest PM_{10} concentration was calculated to be 49.0 $\mu g/m^3$.

PM-10 impacts are shown in Table 24.10. The highest average annual modeled PM_{10} concentration is 3.2 $\mu g/m^3$ occurring at the western boundary of the AIS property. The highest second highest 24-hour modeled PM_{10} concentration is 10.1 $\mu g/m^3$ occurring just outside the western boundary of the AIS property. Impacts on ambient air quality are determined by adding background concentrations to the modeled concentrations. The resulting annual and 24-hour PM_{10} concentrations are 22.2 $\mu g/m^3$ and 59.1 $\mu g/m^3$, respectively. The National Ambient Air Quality Standard for PM_{10} is 50 $\mu g/m^3$ annually and 150 $\mu g/m^3$ on a 24-hour basis.

TSP impacts for the five years of modeling are listed in Table 24.11. The highest average annual modeled TSP concentration is 3.2 $\mu g/m^3$ occurring at the western boundary of the AIS property. The highest second highest 24-hour modeled TSP concentration is 26.5 $\mu g/m^3$ occurring along the western boundary of the AIS property. Impacts on ambient air quality are determined by adding background concentrations to the modeled concentrations. The resulting annual and 24-hour TSP concentrations are 45.2 $\mu g/m^3$ and 133.5 $\mu g/m^3$, respectively. The Minnesota Ambient Air Quality Standards for TSP are 75 $\mu g/m^3$ (primary) and 60 $\mu g/m^3$ (secondary) annual geometric mean concentration and 260 $\mu g/m^3$ (primary) and 150 $\mu g/m^3$ (secondary) 24-hour average concentrations.

It should be noted that the highest background concentrations in the area are very close to the secondary Minnesota Ambient Air Quality Standards for TSP. For comparative purposes, the annual geometric mean TSP concentrations for the past five years are shown in Table 24.9.

Table 24.9
TSP and PM_{10} Background Concentrations

Monitor	Site 940 143 13th Avenue Northeast	Site 907 4646 Humboldt Avenue North
Pollutant	TSP	PM_{10}
Frequency of monitoring	Every 6 days	Every 6 days
PM_{10}/TSP ratio[a]		0.458
Year 1991		
Highest Concentration	115	47
2nd Highest Concentration	91	44
Arithmetic Mean	46	23
Geometric Mean	42	21
Year 1992		
Highest Concentration	132	50
2nd Highest Concentration	**107**	**44**
Arithmetic Mean	42	21
Geometric Mean	37	19
Year 1993		
Highest Concentration	87	54
2nd Highest Concentration	86	42
Arithmetic Mean	38	20
Geometric Mean	34	18

[a] PM_{10}/TSP ratio is based on 1985 through 1988 monitoring data at 4646 Humboldt Avenue North. This ratio is based on the average PM_{10} and TSP concentrations measured over that four year period.

The highest modeled annual PM_{10} concentration at the nearest residence was 0.42 $\mu g/m^3$. The nearest residences are across the Mississippi River, 1,000 feet from the proposed location for the Kondirator.

Table 24.10
MAXIMUM PM_{10} IMPACTS

Year	Maximum 24-Hour Impact (ug/m^3)	Location (m)		Annual Arithmetic Average (ug/m^3)[a]	Location (m)	
		East	North		East	North
1987	58.7	-91.2	120.0	22.2	-91.2	61.9
1988	58.9	-91.2	32.8	22.1	37.3	-120
1989	58.9	-91.2	61.9	22.1	-91.2	91.0
1990	57.5	-91.2	91.0	22.1	-91.2	120.0
1991	59.1	-120.0	90.0	22.1	-91.2	61.9

[a] Annual concentrations are presented as arithmetic averages. The ISCST2 model, which was used to predict ambient concentrations, computes annual averages arithmetically.

Table 24.11
MAXIMUM TSP IMPACTS

Year	Maximum 24-Hour Impact (ug/m^3)	Location (m)		Annual Arithmetic Average (ug/m^3)[a]	Location (m)	
		East	North		East	North
1987	131.4	-91.2	120.0	45.2	-91.2	61.9
1988	133.2	-150.0	90.0	44.7	35.2	-90.6
1989	133.5	-91.2	61.9	44.8	-91.2	91.0
1990	130.0	-91.2	-54.4	44.6	-91.2	120.0
1991	133.2	-120.0	90.0	44.9	-91.2	61.9

[a] Annual concentrations are presented as arithmetic averages. The ISCST2 model, which was used to predict ambient concentrations, computes annual averages arithmetically.

Modeling results and related information are on file at MPCA and may be reviewed on request.

E. PROJECT MITIGATION MEASURES

The mitigation measures assumed in this analysis include the Kondirator Dust Collection System, the Cascade Cleaning System, covered conveyors, direct deposition of waste from the Kondirator into covered shipping containers, and paved roads for trucks accessing the Kondirator, and dust control through sweeping of public streets and internal roadways and watering of exposed areas. All these measures except dust control have been described earlier.

Fugitive dust will be controlled through sweeping and watering. First, AIS will continue to hire a commercial street sweeping firm to weekly sweep Pacific Street North from 26th Avenue North to 31st Avenue North., and 26th, 28th, 30th, and 31st Avenues North from Pacific Street to 2nd Street North . (This is a joint effort with the J. L. Shiely Co. whose sand and gravel facility is located at 26th Avenue North and Pacific Street North.) Second, AIS has its own sweeper which will be used daily to sweep all roadways on the AIS property and to do supplementary sweeping of Pacific Street North from 28th to 31st Avenues North and 28th and 31st Avenues north from Pacific Street to the river. Third, AIS owns a watering truck which will be used to water unpaved areas as needed to control dust. AIS's sweeper and watering truck already undertake these functions.

25. Will the Project Generate Dust Odors, or Noise During Construction and/or Operation?
■ Yes ☐ No

If yes, describe the sources, characteristics, duration, and quantities or intensity, and any proposed measures to mitigate adverse impacts. Also identify the locations of sensitive receptors in the vicinity and estimate the impacts on these receptors.

The dust, odors, and noise analysis is presented in the following sections:

A. Deposition of Stack and Fugitive Emissions
B. Noise Analysis
C. Vibration Associated with the Project

A. DEPOSITION OF STACK AND FUGITIVE EMISSIONS

Total annual deposition of particulates emitted from the Kondirator was estimated using the Industrial Source Complex-Short Term (ISC2ST) dispersion model. Total annual deposition (grams particulate matter/square meter) was estimated using the deposition algorithm in the model.

Two primary sources of emissions were modeled: stack emissions from the Kondirator Dust Control System, and the Cascade Cleaning System; and fugitive emissions from unloading and loading activities.

Model input parameters were identical to those used to model ambient air concentrations of particulates. Particulate emission rates for the Kondirator Dust Control stack and the Cascade Cleaning System stack were developed using data presented in Table 2 of the December 1990 MPCA Air Emission Facility Permit Application prepared by HDR Engineering and information provided by Osborn Engineering regarding the pollution control equipment efficiencies.

Using the particle size distributions presented in Tables 24.2 and 24.4 above, deposition of particulate matter was modeled assuming emission rates of 6.1 lb/hr and 3.88 lb/hr, respectively, for the Kondirator Dust Control System stack and the Cascade Cleaning System stack.

Settling velocities for particle size categories were conservatively calculated by using the upper limit of the category to calculate a settling velocity for the category. A density of 500 lb/ft^3 (representative of steel) was used to calculate settling velocities for various particle sizes. Fugitive emissions from Kondirator processes were assumed to fall into two particle size categories: less than 10 microns, and 10-30 microns. Calculated settling velocities and mass fraction in each category are presented in Table 25.1.

TABLE 25.1
FUGITIVE EMISSION SETTLING VELOCITIES AND MASS FRACTIONS

	Less than 10 microns	**10 - 30 microns**
Settling Velocity (m/s)	0.0218	0.196
Mass Fraction	0.47	0.53

Emissions from the Kondirator Dust Control System stack and the Cascade Cleaning System stack were, based on vendor data, assumed to fall into three particle size categories. The categories, calculated settling velocities, and mass fraction in each category are summarized in Table 25.2.

TABLE 25.2
STACK EMISSION SETTLING VELOCITIES AND MASS FRACTIONS

	Less Than 10 Microns	**10 - 20 Microns**	**20 - 40 Microns**
Kondirator Dust Control System Stack			
Settling Velocity (m/s)	0.0218	0.0871	0.349
Mass Fraction	0.67	0.23	0.10
Cascade Cleaning System Stack			
Settling Velocity (m/s)	0.0218	0.349	1.39 (assumed size of 80 microns)
Mass Fraction	0.07	0.17	0.76

Dry deposition was estimated using model receptors located within the property boundary of the Kondirator facility. Since ISCST2 does not consider terrain when calculating deposition, no receptor elevations were input to the model. The receptor grid used was a 30-meter resolution grid. Using arithmetic averages of annual on-site deposition, averaging both across years and across on-site receptors, the deposition of particulates on site was estimated to be 84.9 g/m^2 over the area draining to the storm water runoff detention pond.

Following MPCA guidance, wet deposition was estimated using model-predicted on-site concentrations and a particulate scavenging ratio for precipitation. [Source: Galloway, et al., *The temporal and spatial variability of scavenging ratios for NSS sulfate, nitrate, methanesulfonate, and sodium in the atmosphere over the North Atlantic Ocean*, Atmos. Env., 1993, pp. 235-250].

According to Galloway, et al. (1993), the pollutant concentration in precipitation (nanomoles per kilogram) is equal to the concentration in air (nanomoles per cubic meter), multiplied by a scavenging ratio (unitless), and divided by the density of air (1.17 kg/m^3). Scavenging ratios can range from 267 for compounds such as methane sulfonate to 4,098 for the sodium ion (as sodium salts), which is highly soluble in water. For purposes of calculating wet deposition of airborne particulates from Kondirator sources, all particles were assumed to be iron (molecular weight of 55.85 nanograms per nanomole), and a scavenging coefficient of 2,000 was assumed, since the scavenging coefficient of iron was not measured by Galloway, et al. The real scavenging coefficient for iron would be much lower, since iron is not readily soluble in water. Using the average on site modeled TSP concentration of 1.74 $\mu g/m^3$, the annual wet deposition of particulates was estimated to be 1.96 $g/m^2/yr$, only 2.3 percent of the total dry deposition.

A quality assurance check was made on the deposition modeling output to validate the results. The model predicts that the average deposition in the modeled area (approximately four square miles - 1,600 meters by 1,600 meters) is calculated to be 12.0 Mg in model year 1987. The total mass emitted by the project is 18.6 Mg. Thus, approximately two-thirds of the particulate matter emitted is deposited in the area surrounding the Kondirator. One would expect that a large fraction (90 percent or so) of the larger size particles would settle out in such an area, while the finer fraction (particles less that 10 microns) would tend to stay suspended (since they have a settling velocity approximately 10 times lower that the larger particles.

Given that approximately three-fourths of the mass leaving the Kondirator consists of particles with a size of 20 microns or larger, with a settling velocity of 0.349 m/s (see Table 25.2), it is expected that the majority of these particles would deposit out over a small area. Based on the above calculations, approximately 88 percent of the particles emitted from the Kondirator deposited in the modeled area. This shows that the deposition model is valid.

The model results and related information are on file at MPCA and may be reviewed on request.

B. NOISE ANALYSIS

The noise analysis is presented in the following sections:

1. Summary
2. Background/Methodology
3. Noise Measurement Data
4. Layout/Mode Of Operation (AIS Property)
5. Projected Noise Levels And Impacts
6. Project Mitigation Measures

1. Summary.

a. Noise criteria.

(1) Minnesota Pollution Control Agency Standards. Noise from the Kondirator installation must comply with noise standards established by the MPCA. See Minn. Rules, Chapter 7030. The standards for residential land uses are the most restrictive. Because noise from the Kondirator will be continuous rather than short term in nature,

the L50 standard (which applies to sounds lasting more than 50 percent of an hour or 30 minutes) is applicable here. That standard is 60 dBA during the daytime period (7:00 a.m. to 10:00 p.m.) when the Kondirator will be operating.

(2) Minneapolis Noise Ordinance. The Special Council Permit for the construction and operation of the Kondirator requires that the installation comply with provisions of Minneapolis Code of Ordinances, Chapter 389, (Minneapolis Noise Ordinance). For daytime operation on Saturdays, Sundays, or Holidays, any noise lasting in excess of 2 hours should not exceed 50 dBA. This is 10 dBA lower than the MPCA requirement. Hence compliance with this ordinance should ensure compliance with the MPCA standard. The Minneapolis noise ordinance also includes octave band limits not covered in the MPCA standards. These limit the level at each octave band on residential property.

b. Noise data.

(1) ***Kondirator Noise Data.*** Noise data for the Kondirator have been obtained from several sources. The manufacturer, Lindemann, has provided a standard noise curve with and without noise shielding. Detailed noise measurements in the vicinity of a Kondirator were made by a consulting firm for French authorities and made available for this study. Noise measurements were made by Lindemann staff during a visit by Dr. David Braslau to a Kondirator installation in Galloo, France. These served as the basic inputs into the noise model for predicting noise from the Kondirator.

(2) ***Background Noise Monitoring.*** Background noise levels were monitored at the residential area across the river east of the AIS property on August 20 and August 22, 1991.

c. Noise control structures.

(1) ***Integral Structural Noise Walls.*** The Kondirator to be installed at the project site will be provided with integral structural noise walls in the vicinity of the shredder and the magnetic separator. These walls will be approximately 10 meters (33 feet) high and shield the noisiest components of the Kondirator.

(2) ***Self-Standing Noise Wall.*** In addition to the integral walls, a self-standing noise wall 35 feet in height and 370 feet long will be constructed between the Kondirator and the Mississippi River to provide additional shielding of noise for the residential areas on the east bank of the river.

d. Noise Projections.

(1) ***Kondirator Noise Prediction.*** Noise levels associated with the Kondirator were predicted for the nearest residences using source data from the Galloo facility and a noise propagation model. With the integral and self-standing walls, the city of Minneapolis noise ordinance level of 50 dBA and the octave band limits are expected to be met. Noise levels at commercial sites on the east site of the river and industrial sites on the west site of the river are also expected to comply with the city noise ordinance and the MPCA noise standards.

(2) ***Truck And Rail Activity.*** Noise levels associated with traffic in the vicinity of the AIS property with and without the Kondirator have been projected. While some increase in level is expected at receptor sites near these roadways, the noise level is below MPCA standards for commercial land uses.

Noise levels associated with increased rail activity associated with the Kondirator are not expected to change significantly, since a maximum of one movement in and out by a railroad switch engine per day is expected to continue although additional rail cars will be carried per switch.

(3) ***Barge Loading.*** Noise levels associated with the loading of barges by crane are expected to decrease due to the smaller size of the material being loaded. Loading of barges by conveyor is not likely to cause an exceedance of MPCA or city standards although the sound level will be continuous rather than periodic as with the crane.

2. Background/Methodology.

a. **Previous studies.** A standardized graph of noise generated by the Kondirator with and without noise control has been prepared by Lindemann and is discussed in Section 3.a.

On March 5, 1991, AIF Services of France made time history measurements at two points at the property line of the Galloo, France, facility to determine compliance with French environmental regulations. The study determined that the levels were above the 65 dBA level for the installation without noise control measures. These results are discussed in Section 3.b.

b. **Visit to Galloo facility.** Dr. David Braslau visited the Galloo facility in France on August 22, 1991. He was accompanied by Klaus Holler, Area Sales Manager for Lindemann, and Dr. Markus Haarhaus of Lindemann. Sound level readings were taken by Dr. Haarhaus and observed by Dr. Braslau. Information that was to be gathered during the visit is available for review on request.

The noise measurements that were made during the visit are described below in Section 3.c along with operating conditions during the measurement period.

c. **Noise impact evaluation methodology.** The methodology followed here is based upon the source noise measurements made at the Galloo facility on August 22, 1991. Observed levels are compared with the standard Lindemann curves and with the AIF Services data taken on March 5, 1991.

For comparison, the source data (measured at 12.2 meters) are used to project sound levels at the property line measurement sites 1 and 2 using a noise propagation model that takes into account spherical spreading of the noise, atmospheric attenuation, and ground effects, where applicable.

Sound levels are then estimated at the residential receptor sites on the east side of the Mississippi River and compared with both the MPCA standards and the Minneapolis noise ordinance. The projected sound levels are based upon noise control measures which are to be incorporated into the construction of the Kondirator facility at the AIS property.

d. Applicable standards.

(1) *Minnesota Pollution Control Agency.* The Kondirator facility will operate only during the daytime hours, 7 a.m. to 10 p.m., as defined by the MPCA. Since noise from the Kondirator facility will normally continue for more than 30 minutes during any one hour, the more restrictive L50 (rather than L10 standards are applicable. The L50 level to be met by the Kondirator at the sensitive residential sites is 60 dBA. The L50 level to be met at adjacent industrial sites is 75 dBA.

(2) *City of Minneapolis.*[24] The Minneapolis noise ordinance includes overall residential sound level limits as shown in Table 25.1. These overall sound levels have been interpreted as dBA levels, since octave bands are included in a separate section of the ordinance. These levels are applicable for weekdays and Saturdays. For Sundays and state and federal holidays, the lower level (50 dBA) is governing.

TABLE 25.1
MINNEAPOLIS NOISE ORDINANCE LIMITS
FOR RESIDENTIAL DISTRICTS

Duration Of Sound	7:00 AM - 6:00 PM	6:00 PM - 10:00 PM
Less than 10 minutes	75 dBA	70 dBA
10 minutes to 2 hours	70 dBA	60 dBA
In excess of 2 hrs	60 dBA	50 dBA

The Minneapolis noise ordinance also indicates that the noise level is not to exceed the existing ambient level by more than 6 dBA.

Octave band standards (maximum permitted levels) included in the Minneapolis noise ordinance are presented in Table 25.2.

[24] To the extent that the city's noise standards require lower noise levels than the MPCA's standards, the city standards may not be unenforceable. Minn. Stat. § 116.07, subd. 2 states in part: "No local governing unit shall set standards describing the maximum levels of sound pressure which are more stringent than those set by the Pollution Control Agency."

TABLE 25.2
APPLICABLE OCTAVE BAND LIMITS
FROM MINNEAPOLIS NOISE ORDINANCE

Octave Band (center)	Residential
63 Hz	72 dB
125	67
250	59
500	52
1000	46
2000	40
4000	34
8000+	32

e. **Ambient noise levels.** On August 20 and August 22, 1991, ambient sound levels were measured at 2230 Marshall Street Northeast across the Mississippi River from the AIS property. They show that the L50 level lies generally below the daytime standard (60 dBA) but lies above the nighttime standard during the early and later portions of that period, and that the L50 level lies below the daytime standard (60 dBA) for the entire monitoring period.

3. Noise Measurement Data.

a. **Generalized Lindemann data.** The generalized Lindemann data for sound produced by a Kondirator with and without sound control measures is available for review on request. The graph assumes a standard 6 dBA noise reduction per doubling of distance that can be expected close to most sources of noise. Some other measurement points are also identified in this data/

b. **French data.** Two points were selected at the property line to determine compliance with French environmental noise standards. The distribution of sound levels for the two sites is available for review on request. Of primary interest here are the L50 levels which are noted below in Table 25.3.

TABLE 25.3
FRENCH SOUND LEVEL MEASUREMENTS AT GALLOO FACILITY

Site	Distance	L50 (dBA)
1	100 m	72.5
2	142 m	67

c. **Site visit data (August 22, 1991).** Listed below are the equipment and relevant parameters during the observation period.

- Bruel and Kjaer Sound Level Meter Type 2235
- Bruel and Kjaer Octave Band Filter Type 1625
- Height of microphone above ground: 1.2 m
- Wind Direction: South (from Kondirator to Site 2)

- Wind Speed: Variable
- Temperature: 27 degrees Centigrade (80 degrees Fahrenheit)
- Site Selection: Previous two AIF sites plus three source sites selected by Dr. Braslau
- Sound Level Readings: Dr. Markus Haarhaus (Lindemann)

The five sites for which sound level readings were taken are listed in Table 25.4.

TABLE 25.4
NOISE MONITORING SITES AT GALLOO FACILITY

Site	Distance (in meters)	
1	100	Same as AIF Services
2	142	Same as AIF Services
3	27	Kondirator axis on side of dust collectors
4	12.2	From Kondirator at edge of sound wall
5	18	From Kondirator on other side of sound wall

A summary of the observed octave band levels and related information is available for review on request.

Comparison between the measured octave band levels at Site 1 and the predicted levels using the assumed source data from Site 4 and the noise propagation model are available for review on request. It can be seen that the agreement is relatively good for the lower frequencies but that there is some divergence at the higher frequencies. This was probably due to other equipment in the vicinity of the monitoring site, since these higher frequencies generally decay at a relatively rapid rate. Use of mitigation to control the lower frequencies is most critical and relatively good agreement between measured and predicted values occurs in this frequency range.

The source level used for input into the noise model is the average octave band level measured at Site 4 in Galloo which was unshielded by the sound barrier and 12.2 meters from the center of the Kondirator. The assumed source octave band levels are shown in Table 25.5.

TABLE 25.5
ASSUMED KONDIRATOR SOUND LEVELS
FOR NOISE MODEL

Frequency (Hz)	Sound Level (dB)
31.5	102
63	98
125	90
250	94
500	91
1000	91
2000	90
4000	84
8000	78

d. **Barge loading noise measurements.** Sound level measurements of barge loading using cranes at the American Iron property were made at two locations: (1) Polish Palace parking lot, 2124 Northeast Marshall, located south of the southerly most barge; and (2) the Buchinger residence's deck overlooking the Mississippi River, 2300 Northeast Marshall, located east of the northerly most barge. Sound level readings were taken on two separate days, September 15 and 30, 1994. On September 15th, however, a second barge was tied to the barge being loaded and may have provided some noise shielding. Therefore, those data have not been used as a basis for further analysis.

(1) ***Instrumentation And Monitoring Periods.*** Noise level readings were made on September 30, 1994, using a Larson-Davis Model 700 sound level analyzer. The meter was placed at 2124 Northeast Marshall for approximately one hour and subsequently moved to 2300 Northeast Marshall for a second hour.

(2) ***Sound Level Readings.*** A summary of readings taken at 2124 Northeast Marshall between 10:15 a.m. and 11:00 a.m. on September 30, 1994, is presented below.

Typical background (no barge loading activity) - 60 dBA

Typical level when crane releases load below the barge's top edge - 65 dBA

Typical level when crane releases load above the barge's top edge - 73 dBA

A summary of readings taken at 2300 Northeast Marshall between 11:00 a.m. and 12 noon on September 30, 1994, is presented below.

Typical background (no barge loading activity) - 62 dBA

Typical level when crane releases load below the barge's top edge - 66 dBA

Typical level when crane releases load *above* the barge's top edge - 75 dBA

Typical noise from scrap pile as crane picks up load - 70 to 75 dBA

At 2124 Northeast Marshall, the background L10 noise level was approximately 62 dBA (compared to the MPCA standard of 65 dBA) while the background L50 noise level was 59-60 dBA (compared with the MPCA standard of 60 dBA). Contributing sources to this background are traffic noise from the Lowry Avenue bridge, the J. L. Shiely Company facilities, other facilities along the Mississippi River, and AIS. At 2300 Northeast Marshall, the background L10 noise level was approximately 64 dBA while the background L50 noise level was just below 62 dBA. The higher L10 background level at 2300 Northeast Marshall was caused by conversation on the deck. The higher L50 background level resulted from closer proximity to traffic noise from the Lowry Avenue bridge. (2300 Northeast Marshall is twice as close to the bridge as 2124 Northeast Marshall.) Therefore, at 2124 Northeast Marshall the existing noise level is just at or below the MPCA L50 standard while at 2300 Northeast Marshall the existing noise level is slightly above the MPCA L50 standard.

(3) ***Compliance With MPCA Noise Standards.*** A typical loading interval with the crane in one location was 30 seconds. Thus, a maximum of 120 loading cycles per hour can be expected. Approximate duration of noise during barge loading was 1.74 seconds. Assuming 2 seconds to be conservative, a maximum of 240 seconds, or four minutes, of barge loading noise per hour above 65 dBA can be expected. This is less than the six-minute period represented by the MPCA L10 standard. Thus, the noise currently associated with barge loading complies with MPCA standards.

Noise generated by dislodged scrap rolling down the pile as a crane picks up a load periodically exceeds 70 dBA. However, this occurred only about one loading cycle in five or 20 percent of the loading cycles and lasted two seconds. With a two-second duration, only about 48 seconds of noise above 65 dBA associated with the scrap pile could be expected in a one hour loading period. Hence, noise from this source complies with the MPCA L10 standard.

Considering scrap pile noise and barge loading noise together still results in four minutes and 48 seconds of noise above 65 dBA, which is less than the 6 minute limit under the MPCA L10 standard.

(4) ***Compliance With City Noise Ordinance.*** No noise associated with the loading of barges is above the 75 dBA limit for noise lasting less than ten minutes a day. Assuming normal continuous loading for eight hours, a total of 32 minutes of noise from barge loading can be expected. This falls into the "ten minutes to two hours" category. Since no barge loading occurs after 6:00 p.m., the 70 dBA level governs allowable sound levels from this operation. Therefore, noise associated with barge loading complies with the city's noise ordinance.

As noted above, it is estimated that only about 6 minutes of noise over 70 dBA occurs during an eight-hour loading period. This duration of noise is governed by the "less than ten minutes" duration level of 75 dBA. Since observed levels did not exceed 75 dBA, noise associated with the scrap piles is also in compliance with the city's noise ordinance.

4. **Layout/Mode Of Operation (AIS Property).**

a. **Layout on AIS Property.** The Kondirator layout on the AIS property is shown in figure 3. It should be noted that the dust collection equipment will be located on the opposite side of the Kondirator at the project site from the Galloo site.

b. **Mode of operation.** The following assumptions are made as to operation of the Kondirator with respect to noise generation:

- Continuous feed from input stockpile
- Continuous feed to output stockpiles
- Feed material (ferrous and non-ferrous scrap)
- Continuous operation of dust control equipment
- Permitted hours of operation:
  7 a.m. - 6 p.m. (Monday - Friday)
  9 a.m. - 6 p.m. (Saturdays, Sundays, and Holidays)

c. **Sources of noise from Kondirator installation.**

(1) ***Kondirator.*** The Kondirator itself (action of hammers and shredding of material within the Kondirator) is the primary source of noise from the facility.

(2) ***Recycling Sieve.*** Materials not falling through the sizing sieve are picked up and fed onto a conveyor to be recycled into the Kondirator.

(3) ***Magnetic Separator Drum.*** This drum separates ferrous from non-ferrous materials and is a secondary source of noise from the facility.

(4) ***Conveyor Belts.*** Some noise from the conveyor belts themselves is expected, although at a level well below that of the Kondirator.

(5) ***Fans For Dust Control Equipment.*** Fans for dust control equipment produce noise at somewhat higher frequencies than that from the Kondirator.

(6) ***Stockpile Feed.*** Material falling from the conveyor belt onto the output stockpile creates noise but with much less energy than emanates from the mechanical equipment associated with the Kondirator.

d. **Non-Kondirator sources.**

(1) ***Trucks On-Site.*** Some noise associated with trucks delivering material to the input stockpile exists and can be expected in the future. Peak hour deliveries at the present time and in the future will be similar so that maximum noise levels associated with on-site truck traffic are not expected to increase.

(2) ***Trucks Off-Site.*** Trucks bringing unprocessed materials to the site and processed materials from the site will travel along several roadways in the industrial district in which the American Iron and Supply site is located. Some increase in noise levels associated with increased truck traffic can be expected. This is addressed in Section 5.b.

(3) *Rail On- And Off-Site.* Noise from rail deliveries to the input stockpile and from Kondirator output stockpiles can be expected. A maximum of one switch per day is provided by CP Rail and this is not expected to change in the future since the additional rail cars per day expected because of the Kondirator can easily be handled by this switch. The noise impacts of rail activity is addressed in Section 5.b.

(4) *Loading Rail Cars.* Loading of rail cars from the output stockpile can be a potential source of noise. However, these noise levels already exist and are not sufficient to cause an exceedance of state or city standards.

(5) *Loading Barges.* Loading of barges from the output stockpile can be a potential source of noise. These noise levels already exist and are not sufficient to cause an exceedance of state or city standards. The noise from the loading of barges with Kondirator output is expected to be at least five dBA quieter than current levels because of the smaller size and weight of material. Noise from barge loading is discussed further in Section 5.b.(3).

e. **Sensitive noise receptors.**

(1) *Homes On East Bank Of Mississippi River.* The most sensitive receptors near the Kondirator installation are the ten homes and apartment building across the Mississippi River to the east. The westerly property line of these homes is located approximately 850 feet from the Kondirator. The MPCA standards for residential land uses and the Minneapolis noise ordinance provisions for Residence District Boundaries apply.

(2) *Adjacent industrial sites.* The site is located in a Heavy Manufacturing District and is surrounded by other heavy manufacturing land uses. The MPCA standards for industrial land uses apply.

f. **Noise control measures incorporated into the facility.** Noise control measures incorporated into the Kondirator facility and on the AIS property include:

(1) *Integral Structural Noise Walls On The Kondirator.* These will be constructed in a manner similar to the walls at the Galloo facility. One wall is to be located east of the shredder with a perpendicular section wrapping around to the west. The other set of walls is to be located around the magnetic separator drum. The walls will be absorptive on the interior and provide for access to the Kondirator. These walls are assumed to be 10 meters or 33 feet in height.

(2) *Self-Standing Noise Wall East Of The Kondirator.* It is proposed that this wall be constructed of absorptive material on both sides, i.e. facing the Kondirator and facing the Mississippi River. This will minimize reflections from the Kondirator to the west and off existing industrial buildings. It will also minimize any new reflections to the east from activity on the river itself. It is currently anticipated that the wall will be constructed using vertical steel H-beams with noise barrier panels sliding into the H-beam channel. The proposed height of the wall is 35 feet above the bottom of the Kondirator.

5. **Projected Noise Levels And Impacts.**

a. **Kondirator sources.**

(1) *Noise Projection Model.* The noise projection model used is the NOISECALC model developed by the New York State Department of Transportation in the early 1980s. Inputs to the model are:

- Sound level spectra for multiple sources
- Source coordinates
- Receiver coordinates
- Excess attenuation due to ground for each sound path (optional)
- Excess attenuation due to wind for each sound path (optional)
- Barrier height and location for each sound path (optional)
- Background noise level (optional)

The model takes into account the spherical spreading of noise and the atmospheric attenuation for each frequency component. It also incorporates other factors which can be specified. The model then produces the expected octave band level at the receiver locations along with the overall A-weighted level. The model has been validated by the New York Department of Transportation and by David Braslau Associates over eight years of application under different conditions and for different sources. The model has been used and validated for projections as far as one mile from the source. Thus, the model is ideally suited for the prediction of noise from the Kondirator and the evaluation of noise barrier of varying heights and locations.

Specific assumptions which have been incorporated into the noise model used here include:

- Atmospheric attenuation under standard atmospheric conditions (59 degrees & 70 percent relative humidity)
- Spherical spreading of sound
- Hard ground (or water) surface (i.e., no ground attenuation)
- No vegetation
- Integral structural barrier (10 meters or 33 feet in height)
- Self-standing wall (35 feet in height)
- Barrier length (370 feet)

The primary errors that might be expected from model applications are temperature, relative humidity, and wind speed and direction. Under standard atmospheric conditions and no wind, the model can predict within 1 dBA of the measured level assuming that the source levels are properly specified. The source levels used here are based upon maximum sound levels observed at the Galloo Kondirator.

Because of the double barrier situation faced here (integral structural barrier and self-standing sound wall), it was necessary to first analyze the effectiveness of the integral structural barrier and then second analyze the effectiveness of the self-standing wall using a new noise source radiating from the top edge of the integral structural barrier.

(2) *Impact On Residential Land Uses.* A table of projected octave band levels at the nearest residence to the Kondirator are shown in Table 25.6.

TABLE 25.6
PROJECTED OCTAVE BAND LEVELS
AT CLOSEST RESIDENTIAL RECEPTOR

Frequency (HZ)	No Barrier (dB)	Integral Barrier Only (dB)	Integral Barrier W/35' Wall (dB)	Minneapolis Residential Ordinance Limits (dB)
63	71	64	57	72
125	69	60	53	67
250	70	58	51	59
500	70	56	48	52
1000	68	51	43	46
2000	67	47	39	40
4000	59	36	31	34
8000	36	13	13	32
dBA	73	57	49	*

* Overall dBA levels specified elsewhere in Minneapolis noise ordinance.

With the combination of the integral structural wall and self-standing wall, the Kondirator is expected to meet the 50 dBA city limit which applies after 6:00 p.m. during weekdays and Saturdays, and all day during Sundays and Holidays.

The projected L50 level of 49 dBA from the Kondirator installation will be less than the observed daytime L50 level ranging from 52 to 60 dBA. The projected L10 level of 52 dBA is below observed L10 levels and the L10 nighttime standard of 55 dBA. Thus, projected noise levels are expected to comply with MPCA nighttime noise standards. In addition, the projected noise from the Kondirator will be in compliance with the requirement of the city of Minneapolis noise ordinance that increases in sound level not be greater than 6 dBA above the ambient.

Documentation and related data are available for review on request.

(3) *Impact On Parkland.* Parks are included under the MPCA Land Use Classification NAC-2 with an L50 standard of 65 dBA. Two park properties are located across the river from the AIS property. The northern park property was recently acquired by the Minneapolis Park and Recreation Board and is currently undeveloped. These park properties are shielded by the sound wall with predicted L50 levels below 50 dBA at both locations. At the southern park property, however, there is a potential for reflection of noise from the Williams Steel building located to the west of the AIS property. The reflected path between the Kondirator and the park is approximately 2,000 feet, which would yield a maximum L50 level of 60 dBA and L10 level of 63 dBA if there were no intervening obstructions or absorption. Thus, no exceedance of the MPCA standards at the southerly park is anticipated due to reflected sound. The potential for mitigating such reflections if they exceed predicted levels is discussed in Section 6.

(4) *Impact On Industrial Land Uses.* Industrial land uses are classified as NAC-3 with an L50 standard of 75 dBA and an L10 standard of 80 dBA. The sound level at the face of the Williams Steel building west of the AIS property, which is the closest industrial property to the Kondirator, is expected to experience levels at or below 75 dBA. Thus no exceedance of the standards or problems with noise at nearby industrial areas are anticipated.

b. Non-Kondirator sources.

(1) ***Truck Activity.*** The number of trucks arriving and departing from the AIS property and the intersections impacted have been developed under the separate traffic analysis. Noise levels associated with traffic through these intersections and the increase in traffic associated with the Kondirator have been estimated using the STAMINA 2.0 roadway noise model developed by the Federal Highway Administration. A high percentage of heavy trucks through these intersections has been assumed (five percent) with an increase to six percent because of the additional trucks associated with the Kondirator.

To provide a measure of current and future noise impact, noise receptor sites have been located 100 feet from each intersection along each of the four legs and 50 feet from the roadway centerline. All of these are commercial or industrial receptor sites as defined in the noise rules promulgated by the MPCA.

The worst-case noise levels from this noise analysis and the level of impact (increase in noise level) because of increased Kondirator traffic is shown in Table 25.7. The MPCA noise standards for commercial receptor sites are not exceeded at any of these receptor sites. The maximum increase in L10 (noise level not be exceeded for ten percent or six minutes of an hour) is 2.3 dBA at Lowry and 2nd Street North. The maximum increase in L50 (noise level not to be exceeded for 50 percent or 30 minutes of an hour) is 2.7 dBA at the same intersection. However, both the future L10 and L50 levels are expected to remain below the MPCA noise standards.

TABLE 25.7
PROJECTED NOISE LEVELS
AT IMPACTED INTERSECTIONS

Intersection	L10 (dBA)	L50 (dBA)	LEG/RECEPTOR
Lowry/Washington			
1993	67.9	60.8	West
1997	68.6	61.6	West
(Impact)	(+0.7)	(+0.8)	
Lowry/2nd St. N.			
1993	67.4	60.5	South
1997	69.7	63.2	South
(Impact)	(+2.3)	(+2.7)	
26th/Washington			
1993	65.7	57.7	North
1997	66.4	58.7	North
(Impact)	(+0.7)	(+1.0)	
26th/2nd St. N.			
1993	65.5	57.4	South
1997	66.5	58.6	South
(Impact)	(+1.0)	(+1.2)	
MPCA Standards	**70.0**	**65.0**	

(2) ***Railroad Activity.*** Railroad activity to and from the AIS property is expected to increase with the Kondirator. This can be seen in Table 25.8.

TABLE 25.8
EXISTING AND FUTURE RAILROAD ACTIVITY

Time Period	Inbound (No. of Cars)	Outbound (No. of Cars)
Existing	35	1,066
1997	3,035	2,535

The number of inbound cars will increase from very few to just over 3,000 per year, yielding an average of about 12 cars per working day. However, up to 17 cars are being handled currently with one switch engine, so that the increase in cars inbound or outbound is not expected to require an additional switch.

Since noise generated by the passage of a rail car is about 30 dBA lower than that of the switch, the expected increase in rail cars will have no significant impact on the noise level associated with the passage of a train traveling to or from AIS property.

(3) ***Barge Activity.*** Currently, the noise level from barge loading at the nearest residential receptor site when the load is released above the top edge of the barge 73 dBA. As noted in Section 3.d., no violation of MPCA standards or the city's noise ordinance occurs when material is loaded by crane. Because the Kondirator output is smaller and more uniform, use of a conveyor to load the barges may be more efficient and cost-effective.

To evaluate the noise associated with barge loading by conveyor, an estimate is made here first, using the basic principles of physics, of the difference in noise level due to the smaller Kondirator output. Barge loading noise occurs when metal scrap hitting the bottom and walls of the barge induces vibrations which radiate out from the barge walls as noise. While only a small amount of the energy imparted to the barge is radiated as noise, it can be assumed that the amount of radiated noise is proportional to the falling energy of the metal. Since this energy is directly proportional to the weight of the material, a reduction in weight of the material being dropped causes a reduction in energy. Assuming that a typical piece of scrap metal being loaded today weighs 50 pounds and a typical piece of Kondirator output weighs only 10 pounds, a reduction in sound level of 7 dBA can be expected.

Thus, when Kondirator output is loaded from above the edge of the barge, the 73 dBA level currently experienced would be reduced seven dBA to 66 dBA. This would be the maximum noise level expected as the barge is initially loaded by conveyor. As the bottom of the barge is covered by Kondirator output, however, the impact of metal on the barge is reduced. It is estimated that the sound level from falling metal will drop at least ten dBA as the depth of material in the bottom of the barge increases preventing direct impact on the bottom of the barge. The 65 dBA (L10) level will be reached within one to two minutes, and the 60 dBA (L50) level will be reached within 10 to 12 minutes after initial loading of the barge by conveyor. Thus, while sound levels from the loading of barges may be more continuous than are currently associated with crane loading, the levels will be lower, and no violation of the MPCA standards or the city's noise ordinance are expected.

6. **Mitigation Of Noise Levels.**

   a. **Kondirator mitigation.** The Kondirator facility will incorporate integral structural noise walls and be further shielded by a self-standing a noise wall between the facility and the sensitive residential receptor sites to the east. With these measures incorporated into the design of the facility, no additional noise mitigation measures will be needed to ensure that state standards or the city of Minneapolis noise ordinance for Saturdays, Sundays, and Holidays are met.

   Reflections from the adjacent industrial buildings can be minimized by the erection of partial barriers and absorption.

   b. **Barge loading mitigation.** Since barge loading noise levels are projected to meet state and city standards, no mitigation is required. If exceedances do occur, however, noise from the loading of barges with Kondirator output can be reduced by placing a layer of material on the bottom of the barge with a crane that releases its load below the top edge of the barge. As noted above, a reduction in noise below current levels can be expected for the crane operation because of the smaller size of the Kondirator output. Once the bottom of the barge has been covered with material, the barge can be loaded by conveyor with noise levels below those currently experienced.

C. VIBRATION ASSOCIATED WITH THE KONDIRATOR

The shredder component of the Kondirator, which is the primary source of potential vibrations, will be vibration isolated by springs from a heavy concrete foundation to minimize the transmission of any vibrations into the ground. This eliminates perceptible ground vibrations even in the immediate vicinity of the Kondirator installation. This treatment, which is not common in other metal recycling installations in the United States, is unique to the Lindemann design.

26. Are Any of the Following Resources on or in Proximity to the Site:

- **a. archeological, historical, or architectural resources?** ☐ **Yes** ■ **No**
- **b. prime or unique farmlands?** ☐ **Yes** ■ **No**
- **c. designated parks, recreation areas, or trails?** ☐ **Yes** ■ **No**
- **d. scenic views and vistas?** ☐ **Yes** ■ **No**
- **e. other unique resources?** ☐ **Yes** ■ **No**

If any items are answered Yes, describe the resource and identify any impacts on the resource due to the project. Describe any measures to be taken to minimize or avoid adverse impacts.

A. ARCHAEOLOGICAL, HISTORICAL, OR ARCHITECTURAL RESOURCES

1. **Archeological Resources.** In 1991, Scott Anfinson, National Register Archaeologist, of the Historical Society was contacted regarding archaeological information and his comments were that he is familiar with the area between the bridges. The area was almost solid lumber yards from Nicollet Island extending two miles north. If there were a saw mill or remnants of one on the AIS property, there would be an interest. He suggested the 1885 Sandborn Atlas and the 1894 Yerkes Atlas be reviewed.

   These and other atlases were reviewed and studied at the Minnesota Historical Society.

   a. **Sandborn Atlas 1885-1989.** The subject property does not have any buildings or structures except for a small building at the southeast corner of Pacific Street North and 31st Avenue North.

   b. **Yerkes Map 1894.** The subject property was occupied by H. C. Akeley Lumber Company. The lumber company extended from the river to the railroad tracks. No structures are shown on the AIS property. However, a saw mill and boiler are shown on the north side of 27th Avenue North extended about 150 feet west of the river. (The Historical Society will not allow this map to be copied.)

   c. **Sandborn Atlas 1912.** No buildings or structures are shown on the AIS property.

   d. **Sandborn Atlas 1912 - 1951.** Lumber piles are shown extending from 31st Avenue North to 30th Avenue North. No information was found south of 29th Avenue North.

e. **Sandborn Atlas 1952.** The atlas indicates that the wood storage area located between 30th Avenue North and 31st Avenue North has been removed. There is no other use to the AIS property except at the south end of the site adjacent to the north side of 28th Avenue North. At this location approximately where Mill Street existed, a vegetable cleaning shed is located and extends from Mill Street to almost the river. In addition, on Lot 6, Block 31, a structure exists which may be a single family dwelling.

AIS purchased only the south portion of the property in 1951. AIS moved onto the site in 1952. No activity associated with AIS Iron is shown on the March 1952 Sandborn Atlas. According to the applicant, a truck farm existed at the sound end of the site. This may explain the dwelling on the north side of 28th Avenue and the vegetable cleaning shed which appear on the 1952 Sandborn Atlas. The northern portion of the site at 31st Avenue North was owned by Onan and was purchased at a later date.

In conclusion, the project site does not appear to have any archaeological significance.

2. **Historical Or Architectural Resources.** The Minneapolis Historical Society was contacted through Martha H. Frey, Preservation Planner, City Planning Department. After a brief discussion in person on August 21, 1991, and two brief telephone discussions on August 22 and 23, 1991, she stated there is nothing of historical significance. The Minnesota Historical Society was contacted. The project was discussed with Dennis Gimmestad who referred the matter to Homer Hruby. Homer Hruby, Inventory Coordinator, indicated there is nothing on the project site or the adjacent property on the register, nor is there any property in the area on the inventory to be evaluated and considered for inclusion on the register.

B. PRIME OR UNIQUE FARMLANDS

There are none on the AIS property.

C. DESIGNATED PARKS, RECREATION AREAS, OR TRAILS

The Minneapolis City Planning Department, was contacted and the project, the zoning, comprehensive plan and various environmental matters were discussed. The AIS property is not designated as a park, recreational area, or for an existing trail.

A bikeway system map is included on page T-17 of the Transportation Chapter of Minneapolis Plan for the 1980s. A proposed addition to the regional trail system extends north of 24th Avenue between the river and the alignment of I-94. Neither the bikeway or the trail is proposed to cross the AIS property.

The Mississippi River Corridor Trails: Upper and Central River, 1990 shows a proposed bicycle trail using existing parkways and city streets. On this map, which is page HD-30 of the comprehensive plan, the location is adjacent to the east side of the alignment of I-94 and does not encroach upon the AIS property.

D. SCENIC VIEWS AND VISTAS

The AIS property site itself is not considered a spectacular viewing point as discussed in the EAW Guidelines given the business being conducted on the AIS property. The inaccessibility to the AIS property and the existing uses, which include buildings, stock piles, and fencing, all block the view to the river.

There is no scenic view or vista on the AIS property except along the eastern edge adjacent to the Mississippi River. The western and central portion is taken up by buildings, stock piles, cranes and yard operations. A solid (non-transparent) fence is located along the west property line. Properties to the north and south are private and used for industrial purposes. The presence and location of the river is not evident or visible from and along Pacific Street North from 28th to 31st Avenues North.

A landscape plan will be developed that will preserve much of the existing vegetation found along the river bank. Additional plant material will include evergreen plantings along the bank and against the sound walls. This evergreen material will also help screen the area during winter months.

These plantings will be located along the AIS property except for the barge loading areas. The barge loading areas need to remain clear for safe operation of the cranes and other loading equipment. The landscape plan is subject to review by NSP as much of the area is within their transmission line easement.

E. OTHER UNIQUE RESOURCES

No other unique resources are visible or are known to exist on the AIS property.

27. Will the Project Create Adverse Visual Impacts? ***(Examples include: glare from intense lights; lights visible in wilderness areas; and large visible plumes from cooling towers or exhaust stacks.)*** ☐ **Yes** ■ **No**

If yes, explain.

A. SUMMARY

The project is not expected to create any glare from intense lights nor will lights be visible in any wilderness area. No large visible plumes from cooling towers or exhaust stacks are anticipated given the nature of the process and the design of the system.

B. GLARE FROM INTENSE LIGHTS

The Kondirator will be lighted sufficiently for safe operation. Five-foot "candles" is the proposed lighting system.

C. LIGHTS VISIBLE IN WILDERNESS AREAS

No wilderness area is close enough to the AIS property to be affected.

D. LARGE VISIBLE PLUMES FROM COOLING TOWERS OR EXHAUST STACKS

No cooling towers or exhaust stacks are included in the facility that would cause visible plumes.

E. OTHER VISUAL IMPACTS

Two other areas of visual impact have been reviewed. The first is the description of visual impact as discussed on page 20 of the EAW Guidelines (June 1990). The second is based on comments received from Neil Anderson, Planner with the city, who indicated that the residents on the east side of the river are concerned about visual aspects.

The EAW Guidelines ask for a description of any non-routine impacts which may be due to the emission of light from that project or due to a visual nuisance caused by the project. The Kondirator and the scrap piles might be viewed by some as falling into the visual nuisance category. This nuisance, if it is one, would be seen from the river side of the AIS property. AIS offered the following facts and opinions about this issue, which is connected to its litigation with the city:

> The concern that some residents on the east side of the river may have is probably based on the envisioned image of the Kondirator. The visual appearance of the Kondirator is relative to several factors including:
>
> - Proximity to the river
> - Height, length and mass of the Kondirator
> - Elevations of the land
> - Transmission towers adjacent to the river and on the streets e.g. Pacific and Marshall
> - Other industrial plants -- especially those with stacks (some very high), conveyer systems, tanks, storage piles, etc.
> - Proximity to residential uses
>
> The AIS property is located in the M3-2 zone which is the city's heaviest industrial zone. The property is only slightly higher than the Mississippi River and is in a valley which parallels the river. Much of the property on the east side of the river is also zoned industrial. Some R-6 zoning and residential structures exist on Marshall Street Northeast near the intersection of 22nd Avenue. However, the east bank properties are about 30 feet higher than the AIS property. The river itself is about 700 feet wide at this point, thus the residential structures are about 900 to 1,000 feet from the proposed Kondirator.
>
> The transmission towers along the river range from 96.8 to 120.5 feet high. The low point of the transmission lines is about 85 feet above the location of the Kondirator. The overhead lines on Pacific and Marshall are about 35-40 feet high. A "survey" (a surveyor's estimation from public rights of way) conducted on September 1, 1995, established the height of many features in the area. The Lafarge Corporation storage silo at 33 26th Avenue North is 114.6 feet tall. The Shiely Company conveyor at 26th Street North reaches 74.1 feet in height. The coal piles at the city's Upper Harbor Terminal were 40.6 feet tall. Other stacks and equipment on other sites appear to be 60 feet high.

In summary, the visual impact question is complex, and involves competing values and laws that govern zoning, property rights, and aesthetics. The appearance of the project seems to be similar to other visual impacts currently in the area. Visual impacts from the project may be reduced by construction of a noise wall which would screen much of the Kondirator and a portion of the scrap piles. In addition, a landscape plan as presented in Question 26 would preserve much of the existing vegetation on the river bank and add evergreen plantings to reduce visual impacts.

28. Compatibility with Plans Is the project subject to an adopted local comprehensive land use plan or any other applicable land use, water, or resource management plan of an local, regional, state, or federal agency? ■ Yes ☐ No

If yes, identify the applicable plan(s), discuss the compatibility of the project with the provisions of the plan(s), and explain how any conflicts between the project and the plan(s) will be resolved. If no, explain.

Compatibility with plans is presented in the following sections:

A. Summary
B. North Washington Industrial Park - 1973 And Subsequent Modifications
C. City Of Minneapolis Comprehensive Plan - 1982
D. The Upper River In Minneapolis - 1985
E. Mississippi River Corridor Critical Area Plan - 1987
F. Commercial Navigation Strategic Plan - 1988
G. Mississippi National River And Recreation Area - 1994

A. SUMMARY

There are a number of plans that are applicable to the AIS property. These plans include the *North Washington Industrial Park*, the city's comprehensive plan - *Minneapolis Plan for the 1980s*, the *Upper River in Minneapolis Concept Plan*, the *Minneapolis Mississippi River Corridor Critical Area Plan*, the *Commercial Navigation Plan*, and the *Mississippi National River and Recreation Area Plan*. All these plans, with the exception of the *Mississippi National River and Recreation Area Plan,* were prepared by the city of Minneapolis. Based on the policies and recommendations stated in each plan, the AIS contends that its current and proposed uses are compatible with all of the plans outlined below. Given the controversy surrounding the project, there are likely to be differing opinions among the EAW commenters.

The following sections describe each plan in context to the AIS property, including policies and recommendations having a bearing on the property's use. The plans are listed in chronological order based on date of initial adoption or publication.

B. NORTH WASHINGTON INDUSTRIAL PARK - 1973 AND SUBSEQUENT MODIFICATIONS

The North Washington Industrial Park (NWIP) is a Tax Increment Financing District established by the city in 1973. The objectives and boundaries of the project were defined in August of 1973, and tax increment financing was established as the primary method of finance for redevelopment in December of that year.

The NWIP boundaries are generally Plymouth Avenue on the south, Interstate 94 on the west, Lowry Avenue on the north and the Mississippi River on the east. See Exhibit 28A: North Washington Industrial Park Boundary Map. When the project area was established, it encompassed approximately 202 acres. There have been ten modifications made to the original NWIP boundaries during the last two decades, increasing the project area to approximately 275 acres.

The main objective of the NWIP, as identified in the initial feasibility study, is to "supply new industrial land for industry and additional land for plant expansion." Secondary goals include environmental improvement, creation of open space, and job creation for residents in nearby North Minneapolis neighborhoods.

The proximity of I-94 and the Mississippi River make the NWIP potentially attractive and desirable as an industrial park development. To realize this potential and meet the NWIP's objectives, the Minneapolis Community Development Agency (MCDA) has acquired and cleared land, removed incompatible structures, prepared sites, installed public improvements, and aided with financing for private construction projects. These activities were necessary to overcome obstacles to private development including fragmented land ownership, unclear land titles, unfavorable soil conditions, and blighted structures.

Most of the early activity focused on the Ironhorse portion of the project area, a large land tract next to the Mississippi River in the southeast part of the NWIP. During the 1980s, activity focused around 2nd Street and 23rd Avenue with job-intensive, light industrial development being the priority.

None of the NWIP activities have involved the AIS property. The Land Use Plan Map shows the AIS property as designated for industrial use. The current and proposed use of the AIS property do not appear to conflict with the NWIP Land Use Plan.

C. CITY OF MINNEAPOLIS COMPREHENSIVE PLAN - 1982

In December of 1982 the city of Minneapolis adopted its Comprehensive Plan: *Minneapolis Plan for the 1980s*. This plan was developed in response to the 1976 Metropolitan Land Planning Act which required the governing bodies in the Twin Cities area to prepare and adopt comprehensive plans consistent with the regional plans of the Twin Cities Metropolitan Council. The plan establishes a number of goals for the city and policies to guide achievement of those goals - a number of which have a bearing on the AIS property.

One element of the Comprehensive Plan is the Land Use Plan. Its purpose is to recognize the unique requirements of each major land use type and it generally seeks to segregate them in easily recognizable geographical areas. Some of the general land use policies that have a bearing on the AIS property include:

* Contiguous land uses should be complementary in function and design.

* The location of land uses should reflect their relative needs for amenities, services and access.

The plan also talks specifically about Industrial Land Uses and states as an objective:

* Provide industrial areas which strengthen the city's economy but protect neighboring land uses.

The plan describes two industrial types: Light Industry and General Industry. Light industrial is described as small in size, contained within a single structure with little or no outside storage. It would not require major transportation facilities close by, would employ a small labor force, would create minimal heavy truck traffic, and would be architecturally compatible with surrounding non-industrial uses.

The plan then states a Light Industrial policy:

* The city should establish a Light Industrial land use category which would be appropriate adjacent to residential property.

General Industry uses would typically require large sites, perhaps several structures, considerable open storage, close proximity to major transportation facilities, would employ a large work force generating substantial traffic, including heavy trucks, and may be visually unattractive.

The plan states a number of General Industry Policies:

* General Industry should be located in areas which have appropriate natural or man-made buffer areas between it other uses.

* Industry that uses the river directly for barging should have the highest priority for river frontage in those areas designated for industry.

In initial draft plans and hearings, the industrial area around, and including the AIS property, was included in the "General Industry" category. However, in the final adopted plan, the area was re-designated as Light Industry, even though the characteristics of the area seem to closely follow the General Industry description. The zoning of this property, however, is the heaviest industrial zoning classification.

Therefore, even though the AIS property was compatible with many of the policies stated in the Comprehensive Plan, it is not compatible with the formal land use designation of the area.

D. THE UPPER RIVER IN MINNEAPOLIS - 1985

This report, developed in 1985, is considered a "Concept Plan for Discussion" and describes current uses in and around the upper river as well as some recommendations for its future use. Recommendations of the plan that affect the AIS property include:

* Underused terminals should be encouraged to increase tonnage.

* River terminals and industry should locate on the west bank of the river due to topography and relationship to neighborhoods.

* River dependent industry can be encouraged to locate or expand on the west bank of the river.

* Encourage residential uses along Marshall Street

* Barge traffic should increase by restricting industrial development to uses which employ river transport.

* Visual attractiveness of land uses which can be seen from the opposite bank of the river should be improved, with screening and landscaping.

* Recommends the AIS property area land uses as "River Related Industry"

The use on the AIS property is consistent with the recommendations of this Plan.

E. MISSISSIPPI RIVER CORRIDOR CRITICAL AREA PLAN - 1987

In 1976, the state declared the Mississippi River corridor through the metropolitan area as a Critical Area, requiring each municipality to develop plans and regulations for its protection. The purpose of the Critical Area Plan was to fulfill the requirements of the Critical Area order by documenting the city's river corridor resources and setting forth those policies and implementation strategies the city has adopted to protect the natural, cultural, historic, commercial, and recreational value of the river corridor. This plan was adopted in July of 1989.

The plan brings together a number of policies that have a bearing on the AIS property. These are listed below.

* General industrial uses should be located in areas which have appropriate natural or man-made buffer areas between them and other uses.

* Industry that uses the river directly for barging should have the highest priority for river frontage in those areas designated for industry.

* Require attractive screening of open storage operations within 300 feet of the river except as precluded by terminal operations.

* Areas appropriate for river terminals are on the west bank of the river between the head of navigation and the railroad bridge north of 25th Avenue North.

* In the upper river, north of Plymouth Avenue, the pedestrian and bicycle trails should continue up along the shoreline along both sides for part of the way and then rejoin the motor route which uses existing city roadways and is located some distance from the river's edge.

It should be noted that the Light Industry and General Industry descriptions are the same as provided in the Comprehensive Plan.

Again, although the area in and around the AIS property closely resembles the General Industry description, the plan designates the area as Light Industry and identifies the area as Appropriate for River Terminals. As with the Comprehensive Plan, the land use designation is not consistent with the zoning classification nor with the Light and General Industrial Land Use descriptions. The city, however, classifies the AIS property as Light Industrial in its Existing Land Use maps.

Although the use is not consistent with the land use designations, based on the policies and recommendations stated in this plan, and the fact that the city classifies this area as Light Industrial in its Existing Land Use maps, the AIS property appears to be compatible with the *Mississippi River Corridor Critical Area Plan.*

F. COMMERCIAL NAVIGATION STRATEGIC PLAN - 1988

This plan was developed to provide direction in the decision making process of Minneapolis as it relates to commercial navigation. The primary focus of the plan is the city owned Upper Harbor Terminal although it does address all commercial navigation activities in the city.

The main concern that prompted the plan was the fact that the US Army Corps of Engineers was concerned that there was not enough commercial river traffic to justify keeping the lock and dam system open on the upper river. The plan outlines recommendations that would increase traffic at the Upper Harbor Terminal. Below are a number of the plan goals and recommendations that are germane to the AIS property:

* Develop and implement plans for the west bank of the Mississippi River between Broadway and Camden which will encourage the growth of the river-dependent and river-related industry.

* Develop a marketing plan for the Upper Harbor Terminal and other river-dependent industries emphasizing adjacent land for river-dependent users.

* Recommendations included:

* Within the Upper Harbor from the Plymouth Bridge to the Camden Bridge, assign the highest priority for river frontage to industry and commerce that have the need to use the river directly for barging.

* Increase traffic from the private terminals in Minneapolis. Liaison with these terminal operators should be maintained an appropriate assistance provided should there be opportunities to expand their business.

The report has recommendations for the AIS property specifically:

AIS - The site, which has nearly 1/4 mile of river frontage, is approximately 13 acres in size. The operator, who currently moves little on the river, has expressed interest in capital improvements to increase their business and to do landscaping. Opportunities for this site should be carefully weighed. They include:

* Improvements for AIS

* Consolidation with other scrap operators

* New ownership and a more river-dependent use

Because AIS is proposing to expand a river dependent industrial use in a manner that would increase its barging activities, the proposed project is compatible with the goals, policies and recommendations of this plan.

G. MISSISSIPPI NATIONAL RIVER AND RECREATION AREA - 1994

The Mississippi National River and Recreation Area (MNRRA) was designated by Congress in 1988. The Mississippi River Coordinating Commission was established by the act to ensure local assistance to the Secretary of the Interior in planning for the National River and Recreation Area. The legislation provided for extensive federal, state, and local coordination in managing the river corridor and its nationally significant historical, recreational, scenic, cultural, natural, economic, and scientific resources.

The MNRRA Comprehensive Master Plan (MNRRA Plan) was signed by the Governor of Minnesota in September of 1994 and approved by the Secretary of the Interior in May of 1995. The MNRRA Plan attempts to balance both the economic and natural preservation needs of the river but is considered nonbinding. Authority is ceded to the underlying local unit of government, and the Commission has no real regulatory authority.

To promote the river's economic resources, the MNRRA Plan contains a number of Economic Resource Management Policies And Actions. The company contends that its project fits many of these, and states that:

- The project is a business investment in the river corridor in compliance with Policy 2.
- The project preserves riverfront land for a business that relies on the river in compliance with Policy 3.
- The project continues an existing land use in the corridor in compliance with Policy 6.
- The project is an expansion of an existing corridor business in compliance with Policy 7.
- The project expands a sustainable economic activity, the recycling of metal, in compliance with Policy 8.
- The project preserves AIS's existing riverfront investment by allowing the company to remain competitive in the metal recycling industry in compliance with Policy 15.
- The MNRRA Plan also contains a number of Natural Resources Management Policies and Actions. The project adheres to many of these.
- The project will meet or exceed existing air and water quality standards in compliance with Air And Water Policy 1.
- The permanent runoff detention pond will significantly reduce runoff from the AIS property in compliance with Air and Water Policy 2.

- AIS is participating in the MPCA VIC Program to address any contamination on its property in compliance with Air and Water Policy 7. The project may require acceleration of those efforts on the project site which advances Air and Water Policy 12.

- The project's permanent runoff detention pond and use of an apron between barge and shore implement AIS's spill prevention plan for the river in compliance with Air and Water Policy 15.

- The project's landscape plan for the riverbank uses native species where possible to restore and enhance the riverbank in compliance with Native Flora and Fauna Policy 5.

Based on its compatibility with the general intent of the MNRRA Plan and its adherence to many of the plan's policies, AIS contends that its project appears compatible with the MNRRA Plan. However, the plan attempts to balance a number of interests, including industrial, environmental, and recreational. The MPCA is neutral on this question, and expects other views to be expressed during the EAW comment period.

29. Impact on Infrastructure and Public Services Will new or expanded utilities, roads, other infrastructure, or public services be required to serve the project?
☐ Yes ■ No

If yes, describe the new or additional infrastructure /services needed.

Installation of the Kondirator on the AIS property would not generate a need for new or additional infrastructure as far as sanitary sewers or storm sewers are concerned. Current sanitary sewer services will be adequate to serve the AIS property after Kondirator installation. A storm water runoff detention ponding will be installed on project site without causing new or upgraded public runoff conveyance or treatment facilities to be built. A small fraction of the site runoff is discharged to and will continue to be discharged to public storm sewers along streets on the perimeter of the AIS property. This runoff will not cause the design capacities of the public storm sewers to be exceeded.

30. Related Developments; Cumulative Impacts

a. Are future stages of this development planned or likely? ☐ Yes ■ No

If yes, briefly describe future stages, their timing, and plans for environmental review.

b. Is this project a subsequent stage of an earlier project? ☐ Yes ■ No

If yes, briefly describe the past development, its timing, and any past environmental review.

c. Is other development anticipated on adjacent lands <u>or outlots</u>? ☐ Yes ■ No

If yes, briefly describe the development and its relationship to the present project.

d. If a, b, or c were marked Yes, discuss any cumulative environmental impacts resulting from this project and the other development.

31. Other Potential Environmental Impacts If the project may cause any adverse environmental impacts which were not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

PROJECT HISTORY

This EAW process differs significantly from any other in memory, not only in that special legislation was passed mandating it, but also in that that same legislation directed the MPCA to prepare a risk assessment on the project in addition to the EAW. It is this risk assessment requirement that gives the regulatory component of this case an added dimension: despite the fact that the particulate emissions projected from this project are well within the MPCA guidelines for permitting, other things being equal, the finding that *even at this low emission rate* an emission source may pose human health and ecological risks, depending on a number of factors, means that this EAW cannot simply say that the very low emission rate indicates low probability of significant effects, as it might otherwise do.

This project has been a controversial one from the very beginning in 1989. While at first glance a proposal to install a scrap metal shredding machine at a site in a heavy industrial area that had processed scrap metal for decades might warrant no more than a flicker of interest, this project has attracted considerable attention, largely unfavorable, from the start.

Although the city of Minneapolis initially undertook to subject the project to environmental review, disputes with the company on a number of fronts brought the process to a halt. The Legislature stepped in at that point and directed that the MPCA assume the role of Responsible Governmental Unit for the EAW, and in addition prepare a risk assessment on the project. While this is a truly extraordinary occurrence in the sense that it is extremely rare for the legislature to order environmental review and a risk assessment for a facility for which no mandatory environmental review category exists, it is nonetheless the expressed will of the supreme policy making body for the state.

The MPCA's actions in carrying out this mandate have been guided first and foremost by the need to identify the key environmental issues and address them so as to assure that human health and the environment are protected. The agency's final action in this matter is and can only be to determine whether this project can be implemented so as to accomplish that goal. How the agency has analyzed that question, our findings, and the process we will follow to draw conclusions about them are the subject of this section.

RISK ASSESSMENT

Introduction. This was the first major activity the MPCA undertook in its management of this case. From the outset it was determined that the major stakeholders should be involved in the development of the risk assessment process and documents. Accordingly, and with the concurrence of the company, the staff arranged for the Minnesota Department of Health, the city of Minneapolis, and AIS itself to review drafts, suggest changes, and provide data and information to be used in the process. All availed themselves of the opportunity.

The MPCA hired ICF Kaiser Engineers of Fairfax, VA, an experienced and knowledgeable risk assessment contractor, to prepare the risk assessments. Because the site is adjacent to the Mississippi River, with its enhanced status as a state-designated Critical Area and federally designated National Recreation Area, the staff determined early on that the risk assessment must address not only human health but also ecological issues as well. Ultimately, separate human health and ecological risk assessment documents were prepared.

A risk assessment employs several procedures to do its job of determining the potential for human health and ecological risks. First, the chemicals (or contaminants) of concern must be identified. This is usually done by analyzing the proposed project to see what pollutants it would discharge to the environment after appropriate pollution controls are installed. Then, the *pathways* by which contaminants are *transported* in problematic amounts to humans, animal, and/or plants (receptors), if any, are identified. Once it is determined that the receptors may be exposed to the contaminants, the amounts they would be exposed to are compared to levels that are known (usually from medical and other scientific literature, if available) to cause health or ecological problems in people or other organisms. If the exposure assessment shows that the exposure exceeds levels above which adverse effects such as cancer in humans or eggshell thinning in falcons (the latter was not found in this case) are likely, and, very importantly, if the number of individuals adversely affected exceeds an "acceptable risk threshold" (also called "risk yardstick" or, more informally, "the bright line")established by a duly authorized agency of government, the conclusion of the risk assessment is that significant potential risk has been found.

But this is not the end of the story. Risk assessments are not absolutely definitive documents. At every one of the steps outlined above, it is *extremely rare* to find that hard data exist to use in the necessary calculations. Although it is required in the Kondirator law, no operational data from existing Kondirators or similar facilities was made available to the MPCA and ICF to use in identifying chemicals of concern, emission rates, or other equipment characteristics for the risk assessment (this is dealt with in greater detail below). Also, it is not unusual to find that the scientific literature does not contain information about the effects of the particular chemicals of concern on the receptors in question. In situations such as these, where the data needs do not match the data available, *surrogate data sets* and *computer models* must be used. This contributes to the *uncertainty* associated with the risk assessment, and *nearly all have it to some degree.* A risk assessment is, after all, a *calculation exercise* based on the best available data, which may not be very good. One thing we know for sure is that if we input a number into a model, we *will* get a number out. Whether it is a number that is reliable and upon which a regulatory decision can be based is dependent on maintaining an acceptable level of uncertainty in the process.

When the available data does not match the project data needs exactly, the usual recourse is to make realistic *assumptions* about the project. Lack of hard data required a number of assumptions about this project, such as the assumption that the particulate matter emitted from the machine would be essentially identical chemically to the material fed into the machine to be shredded. That is, if the feedstock is X percent iron, the emitted dust would be X percent iron as well. This seems intuitive, but *is* an assumption because no information is available on the speciation of emissions from a Kondirator of this configuration with its particular scrap feedstock. Another assumption is that, as emitted dust is transported downwind, no *scavenging* occurs; that is, no dust falls to earth as the plume moves downwind. Actually, we know intuitively that there is fallout as the emissions move away from the source, but we assume otherwise in order to maximize the calculated risks at downwind receptors in a purposeful effort to assure that the analysis is *conservative*. This is a desirable feature of risk assessments in those cases (nearly all) for which definitive data are not available for all components of the analysis (i.e., there is uncertainty), in order to help assure that risks will not be underestimated. The result in this example is that the risk assessment assumes that all receptors are exposed to everything that comes out of the machine, which maximizes the calculated impact. This and other assumptions in both risk assessments are quite conservative.

Limited time and funding, as well as the lack of actual emissions data for operational Kondirators, necessitated selection of a screening level risk assessment analysis. Screening level risk analyses are designed to determine whether acceptable risk thresholds have been exceeded for a proposed facility. If screening level risk assessment calculations show an exceedance of an acceptable risk threshold, such findings could result in a determination that a full scale risk assessment be conducted. This issue is also addressed in more detail below. A full scale risk assessment would take longer and cost more, but would also provide a more definitive risk estimate.

Findings. Both screening level risk assessments were based on a 15 year and 70 year operational lifetime for the Kondirator. The 15 year scenario is based on the permittees proposed operational lifetime for the Kondirator. This means that the emission source would exist on the site for only 15 years, and after that no more such emissions would issue from the site. After this time, no inhalation pathway would exist, of course, since nothing more is being emitted into the air, and the soil and river sediment ingestion pathways would be affected only by particulates deposited in those media for 15 years. The 70 year scenario assumes that the proposed a metal shredding machine will be operating at the site for 70 years.

The 70-year scenario envisions a machine emitting particulates at a constant rate for 70 years, with correspondingly greater buildup of metal dust in soil and sediment, and the inhalation pathway would exist for the whole time. Clearly, assuming this scenario would mean that the potential risks calculated would be greater.

Both the human health and ecological risk assessments calculated potential risk levels that exceed acceptable risk thresholds established by the Minnesota Department of Health (MDH), U.S. EPA, or MPCA for several contaminants of concern. These findings are based on quantitative and qualitative assumptions, input data, mathematical modeling and project proposer equipment specifications used by MPCA's risk assessment contractor ICF Kaiser to conduct the risk assessments. Numerical risk findings by exposure pathway and route, individual or multiple chemicals, child, adult, plant or animal can be found in the "Risk Characterization" sections of the human health and ecological risk assessment with their accompanying text, tables and appendices.

Important findings of the risk assessments include:

A. 15 Year Scenario

* Incidental ingestion of soil by a child exceeded the MDH acceptable cancer risk level. Calculated cancer risks for children were 3 per 100,000 as compared to the MDH acceptable excess cancer risk level of one per 100,000.

* Incidental ingestion of soil (child plus adult) exceeded the MDH acceptable cancer risk level. Calculated cancer risks of four per 100,000 were found as compared to the MDH acceptable excess cancer risk level of one per 100,000.

* No other evaluated exposure scenario exceeded acceptable cancer (e.g., ingestion of fish, inhalation of air emissions) or non-cancer (e.g., ingestion of fish or sediment, inhalation of air emissions) risk thresholds.

* For several chemicals of concern, calculated ecological risks exceeded acceptable risk thresholds for terrestrial plants, earthworms, robin, shrew and aquatic life in surface water.

B. 70 Year Scenario

* Incidental ingestion of soil (child plus adult) exceeded the MDH acceptable cancer risk level. Calculated cancer risks of two per 10,000 were found as compared to the MDH acceptable excess cancer risk level of one per 100,000.

* Inhalation of air emissions by adult residents exceeded the MDH acceptable cancer risk level. Calculated cancer risks of two per 100,000 were found as compared to the MDH acceptable excess cancer risk level of one per 100,000.

* Incidental ingestion of soil by a child would exceed an acceptable Hazard Index. A calculated non-cancer Hazard Index of three was found as compared to an acceptable Hazard Index of one.

* Calculated ecological risks for substances exceeding 15-year risk thresholds would increase. Increasing the operational lifetime to 70 years results in additional chemicals exceeding risk thresholds. For several chemicals of concern, calculated ecological risks exceeded acceptable risk thresholds for terrestrial plants, earthworms, robin, shrew and mink. ER-L values for four chemicals would exceed their acceptable risk thresholds.

This is only a summary of the development process and findings of the risk assessments. More information, if needed, should be sought from the documents used to develop the risk assessment, which are available for review at MPCA offices and at other locations in Minneapolis.

Lead. For a number of reasons, explained in detail in the HHRA, lead was analyzed as a special case in the risk assessment process. A key reason was the known effects of lead on young children, who represent the demographic group most sensitive to lead exposure. Different analytical methods (comprising a special computer model) were used to analyze the potential lead risk from this project, pursuant to EPA guidelines.

The results were compared to the "Safe Blood Lead Level" established by the MDH, which is one microgram of lead per deciliter (ug/dl) of blood. A key fact to remember about this number is that it is already exceeded by most people, including children, in the US, due to bodily intake of lead from other sources such as auto emissions and paint. The MDH derived this number from the Centers for Disease Control finding that that ten ug/dl is a "threshold for concern." This is also the EPA's specified number, and EPA considers it an "action level" if more than five percent of children in the area would have blood lead levels greater than this number. The MDH applied an "uncertainty factor" of ten to this number to arrive at its "Safe Blood Lead Level" of one ug/dl. This is a common regulatory technique for development of environmental standards and guidelines.

The risk assessment found that the Kondirator alone would add 0.2 - 0.4 ug/dl to the existing blood levels of affected human receptors. When added to existing background lead concentrations, the blood lead levels predicted by the risk assessment were in the range 2.5-4.1 ug/dl, which is above the MDH threshold of concern (one ug/dl) but below the EPA number (ten ug/dl). This assumes, as the risk assessment does, that existing *background* human blood lead concentrations in the vicinity of the site range from 2.3 to 3.7 ug/dl, again, above the MDH concern threshold but below the EPA concern threshold.

Finally, EPA's action level is a blood lead concentration of ten ug/dl *in five percent or more of young children.* In this case, the risk assessment predicts that Kondirator emissions, when added to existing background, would result in 1.56 percent of infants and .97 percent of children one to seven years old having blood lead levels above this threshold. The MDH has not promulgated a parallel criterion.

However, the MDH has noted that, since most Americans likely do exceed the MDH Safe Blood Level, any incremental increase from a particular source is potentially problematic. And, there is an incremental increase projected from this source. The question is, how significant is it?

In a memo to the MPCA on the subject, the MDH staff noted that when the calculated "hazard quotients" of those Kondirator particulates that are known neurotoxins (lead, manganese and arsenic) are added together, they add up to 1.2. A combined hazard quotient level of 1.0 is regarded as the threshold for concern, but the MDH regards 1.2 as not significantly different from 1.0. The MDH does also note concern over the fact that the Kondirator emissions themselves are at the maximum level that could be considered safe (in comparison with the MDH Safe Blood Lead Level), and they therefore increase the potential for neurological impacts to humans in the surrounding area. It should be remembered, however, that the above analysis is based on the use of the MDH threshold of concern, rather than the EPA number. Use of the latter would result in very different findings, showing less risk.

Interpretation. The MPCA staff observes that the risk assessments predict that several risk thresholds are crossed by projected Kondirator emissions. These are not isolated occurrences, which might make the call more difficult. Based on the assumptions, input data, analytical methods, site specific characteristics, and equipment specifications employed in developing these risk assessments, the project as configured and analyzed has the potential for significant human health and ecological risk. The risk assessments themselves are clear and unambiguous, to the extent that the logic train is clear and the calculations are reproducible. At the risk of repetition, *these* input variables, from *this* equipment configuration, when analyzed with *these* analytical methods based on *these* assumptions, results in a showing of potential risk.

The flip side of this statement is that if any of the inputs are changed, the result *will* be different. And reasonable people can disagree on whether they should be changed.

When the risk assessments were completed and their results assimilated, the staff communicated to AIS its belief that there were four options for proceeding. These were outlined as follows:

* **Revise the draft EAW to reflect additional mitigation (that is, additional air pollution control equipment), document that this additional mitigation reduces the estimated potential risks to below concern levels, and put it on public notice along with the risk assessments.**

The staff told AIS that this was the agency's preferred option. This position was based on the expressed wish of the agency to satisfactorily complete the Kondirator environmental review process in an environmentally responsible way at the earliest possible date. This also reflected the company's wish to bring to a close a process that, for them, began almost six years ago, and had already gone on much too long. The staff believed, and still does, that this option represents the best hope the stakeholders have of resolving a long and contentious matter as soon as possible while simultaneously resolving the environmental issues, and protecting human health and the environment.

* **Complete the existing draft EAW (without additional mitigation), and put it on public notice along with the risk assessments.**

This option would adhere strictly to the letter of the special Kondirator legislation, which requires an EAW, a risk assessment, and a public meeting. The staff told the company it could support this option, but noted that it would mean publishing an EAW whose findings would be that significant potential risk would be associated with the project. This would make a Positive Declaration for an EIS a likely outcome.

* **Proceed directly to a full scale risk assessment and EIS.**

Since this would be the likely outcome of the preceding option (above), the staff could support this option as well.

* **Selectively recalculate those inputs showing risk to bring the final risk numbers below the levels of concern, then public notice the results along with the completed existing draft EAW and the risk assessments.**

The staff could not and does not support this option, although it is the company's preference.

The company prefers this option based on its contention that the risk assessments, being screening level analyses, have eliminated most of the chemicals of concern, pathways, and exposure concentrations as elements of concern, leaving relatively few that still show risk. These, the company proposes to reanalyze with different input data, analytical methods, and/or assumptions. Doing this, AIS maintains, would show that the risks calculated in the existing risk assessments are not risks at all, and would do away simultaneously with the need for additional mitigation and additional environmental review. In support of this position, AIS has prepared a "Focused Risk Assessment" (available for review from the MPCA on request) that demonstrates that, as noted above, with different input variables and assumptions, the calculated risks do in fact change for the better.

AIS bases this analysis on EPA guidance that purports to show that the different analytical techniques and assumptions AIS employed are reasonable to use in this context. The staff disagrees.

The staff's position is based on a number of considerations.

1. For one, the EPA guidance cited by AIS as proof that EPA guidance allows, in fact requires, use of the methods and assumptions AIS used in the Focused Risk Assessment, has been examined by MPCA staff and found not relevant to screening level risk assessments. For the most part, this guidance is intended by EPA to be used in preparing *full scale* risk assessments, which was not done here due to time and funding constraints. The staff would have no problem deferring to this guidance if the company had elected to move on and prepare a full scale risk assessment and EIS, but AIS was and is not willing to do this. Moreover, while EPA guidance suggests the use of this guidance for full scale risk assessments, it is not required; it is guidance only. Perhaps one reason for this is that EPA has not yet published default values and other tools to implement this guidance, rendering the following of it more difficult.

2. Another consideration is that AIS proposes to alter some of the input assumptions used in the original risk assessments as part of its "Focused Risk Assessment." One example is the number days it is assumed that children incidentally ingest soil, thereby being exposed to certain contaminants. AIS wishes to assume a lower number of days per year than the risk assessments did. The staff sees several problems with this:

* The number of days used was the EPA default value. AIS supports using EPA guidance elsewhere, but not here.

* There is much more uncertainty associated with other assumptions than with this one, meaning that even if this change is granted, the results still are overshadowed by this greater uncertainty. The result is that the risk number associated with soil ingestion would change, but that number would still fall within the same uncertainty range, meaning that the risk assessment's actual determination of risk would not change.

* AIS bases its wish to depart from the EPA default value on its finding that the scientific literature EPA used to establish its default value has been superseded by a later publication by the same author that considerably reduced the expected exposure period. However, the staff has reviewed at least one even later publication, again by the same author, that questions the conclusions published in the paper cited by AIS.

3. Third, the staff group disputes AIS's premise that the screening level risk assessments eliminated the majority of the chemicals of concern and pathways from the need for further attention. This can only be true if the original data set provided by AIS and used by ICF Kaiser to prepare the risk assessments was the best and most appropriate data set available to use for this purpose. AIS maintains that it was. The staff group disagrees, for several reasons.

   a. While the staff does not dispute that the data set used was compiled legitimately for its intended purpose (namely, occupational health protection), and ICF Kaiser agreed that *in the absence of any other, better data,* it would serve the risk assessment's purpose, the staff also notes that the data set, made up of Material Safety Data Sheets, was not designed for risk assessment, meaning, among other things, that it is possible that chemicals of concern to risk assessment might have been ignored in them *if they are not of concern for occupational health reasons.* And, if they were not in the MSDSs, they did not get analyzed in the Kondirator risk assessments.

   b. It would also be possible that the MSDSs might be out of date (they were compiled a number of years ago), and more up-to-date data might be available. The staff asked AIS to conduct a literature search to rule out this possibility, and AIS subsequently submitted the results of the search they performed. The staff agreed that what was found was not useful, but notes that quick searches by MPCA employees and ICF Kaiser turned up materials that did not show up on the AIS search, which led to the conclusion that the original search might have missed other material that would have been useful. Moreover, it appears that state and federal regulators who work with the scrap industry were not contacted for information they might have, such as monitoring data or in-house reports.

   c. A related concern is that, after the first final draft of the risk assessments was distributed to the external reviewers (the city, MDH, and AIS), AIS submitted to the MPCA two papers indicating that the concentrations of certain metals in scrap feedstock were in fact lower than the MSDSs indicated. Such data would of course indicate that calculated risks would be lower for those metals, and might change the findings of the risk assessment. However, this raised questions in the staff's mind about the rest of the MSDS data, since if part of it was wrong, other parts may be wrong as well, and they may be wrong in the other direction. Since it was late in the game at that point (the risk assessment was essentially complete, and developing a new data base would have meant starting over), the staff decided to finish the process with the original data set, and deal with the question of more analysis with a different data set at a later date.

d. Another key question from the beginning has been the availability of operational data for use in the risk assessment, particularly operational data from Kondirators. It goes without saying that good operational data would be the best basis for a risk assessment and EAW, and the MPCA typically uses such data in its environmental review documents when it is available. The special Kondirator legislation requires the use of operational data, if not from Kondirators then similar facilities (such as other metal shredders). Of course, if such data is not available, a surrogate data set must be used (as was done here) but the key to satisfying the legislative directive is demonstrating that no suitable operational data exists if this course of action is to be followed.

The company responded at the outset that no operational shredder (especially Kondirator) data was known to be available, but it would not be useful in any case since the other machines all process auto hulks, and the AIS machine would not. Nonetheless, the staff asked for a search and written documentation that no operational data existed. If any was found, the staff wished to examine it and determine its usefulness or lack thereof. Unfortunately, no such documentation was provided until a letter from the Kondirator manufacturer dated April 11, 1995, arrived in the MPCA offices on September 13, 1995.

This letter showed that some operational data did in fact exist, but that it was limited in volume and scope. Much of it is data on noise emissions. Some is in a foreign language and not translated, and some that is translated appears to use foreign syntax and is difficult to understand. Also, the responses to our questions in the letter appeared to indicate, not that the manufacturer had contacted all Kondirator facilities and asked them for operational data, but merely that it had no such data in its home office files. In any case, the letter arrived too late to use in the risk assessment, even had its contents been useful. The risk assessments were developed with surrogate data as a result. Again, it appears possible that the search for operational data might have missed some potentially useful material, or at least this possibility cannot be ruled out with the information now available.

In sum, while the MPCA and ICF have agreed that the MSDS data set is a legitimate data set and okay to use in the absence of anything better, the agency is not confident, for the above reasons, that there is not better data out there that would be more suitable. For that reason, we cannot agree that the screening level risk assessments have conclusively eliminated those chemicals of concern not showing risk from the need for additional analysis and/or mitigation.

For this reason, the staff group has determined that any further risk analysis must take the form of a full scale risk assessment that includes development of an updated data set and addresses all chemicals of concern. In the absence of such additional work, which the staff group would support but which would take time, mitigation of the potential risks identified in the risk assessments is the only real option.

4. It is possible, but not certain, that a full scale risk assessment would find the potential risks identified in the screening-level risk assessments to be insignificant. However, since uncertainties exist surrounding the input data set and other factors, and an updated data set would have to be developed, other risks could be identified as well. It is thus not feasible to assume that the outcome of more work would unquestionably favor the company, and thus not be needed.

5. Finally, to allow AIS to essentially substitute its Focused Risk Assessment findings for the risk assessments, objectionable for all the above reasons, is also objectionable because it amounts to allowing one of the stakeholders, in this case AIS, to redo the risk assessment development process entirely on its own, without the extensive involvement, review, and comments of the other parties that marked the original risk assessment development process, using inputs and assumptions it alone had approved and with many of which the staff group disagrees, with no MPCA control over consultant performance; yet would have required that the MPCA accept and endorse the outcome. The agency cannot live with that scenario.

This led the staff group to conclude that a selective recalculation of the risk numbers was not feasible, although the other options listed above would be acceptable. Given that the strong desire of all parties was and is to satisfactorily conclude this process as soon as possible, the agency provisionally selected the mitigation option. After due deliberation, AIS concurred.

RISK REDUCTION MEASURES

AIS has proposed additional mitigation measures aimed at reducing the potential risk identified in the risk assessments to acceptable levels. The proposed mitigation is in the form of a fabric filter through which all Kondirator source emissions would be passed before release to the atmosphere.

The key to success for such additional mitigation is determining that it will in fact reduce the potential risk to acceptable levels. AIS and MPCA staff have developed an analysis (available for review on request) that shows that

* The emission rate of the Kondirator in the initial configuration (without the fabric filter) is 9.98 pounds per hour from the stacks.

* This rate must be reduced to about .49 pounds per hour in order to reduce the potential human health risk to the MDH risk threshold of one excess cancer death per 100,000 individuals.

* The rate must be reduced to about .1 pound per hour in order to reduce the potential ecological risk to below the risk threshold.

With this information, AIS sought certification from air pollution control equipment vendors that their equipment could achieve an emission rate that would satisfy the above requirements. One vendor agreed to certify a .43 pound per hour emission rate, which is below the human health threshold but above the ecological threshold, and AIS has accordingly proposed this number as a permit condition. If approved by the MPCA, this rate would have to be demonstrated by a stack test under operational conditions.

Vendor data on the fabric filter is on file at the MPCA and is available for review on request.

32. **SUMMARY OF ISSUES List any impacts and issues identified that may require further investigation before the project is commenced. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.**

N/A.

CERTIFICATIONS BY THE RGU (all 3 certifications must be signed for EQB acceptance of the EAW for publication of notice in the EQB Monitor).

A. I hereby certify that the information contained in this document is accurate and complete to the best of my knowledge.

Signature Paul Hoff

B. I hereby certify that the project described in this EAW is the complete project and there are no other projects, project stages, or project components, other than those described in this document, which are related to the project as "connected actions" or "phased actions," as defined, respectively, at Minn. Rules pt. 4410.0200, subp. 9b and subp. 60.

Signature Paul Hoff

C. I hereby certify that copies of the completed EAW are being sent to all points on the official EQB EAW distribution list.

Signature Paul Hoff

Title of Signer Director, Environmental Planning and Review Office

Date 10/9/95

Figure 1

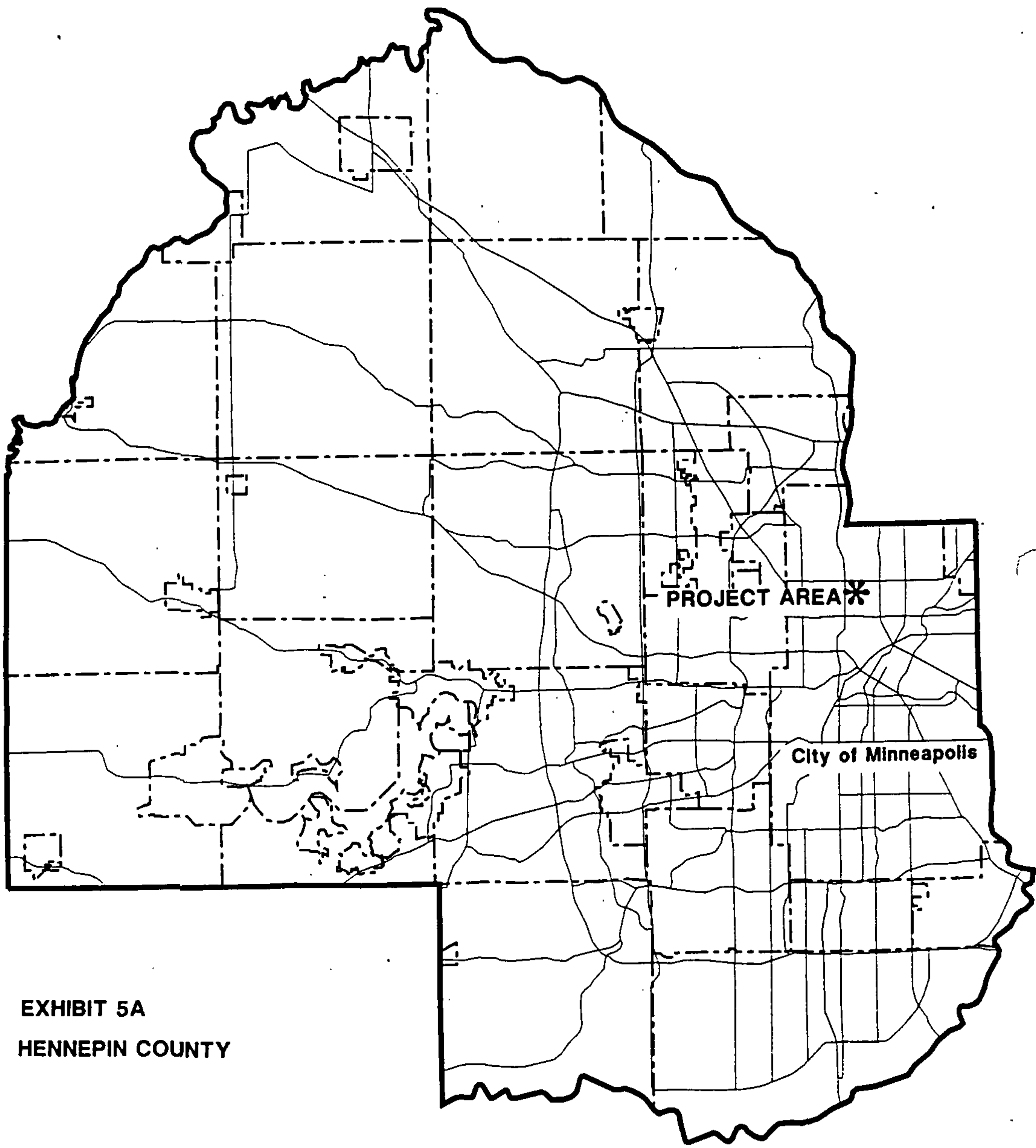


EXHIBIT 5A

HENNEPIN COUNTY

Figure 2

(ST. PAUL WEST)
7373 I NW

1 MILE

ROAD CLASSIFICATION

Heavy-duty		Light-duty	
Medium-duty		Unimproved dirt	

Interstate Route   U. S. Route   State Route

MINN

QUADRANGLE LOCATION

MINNEAPOLIS NORTH, MINN.

45093-A3-TF-024

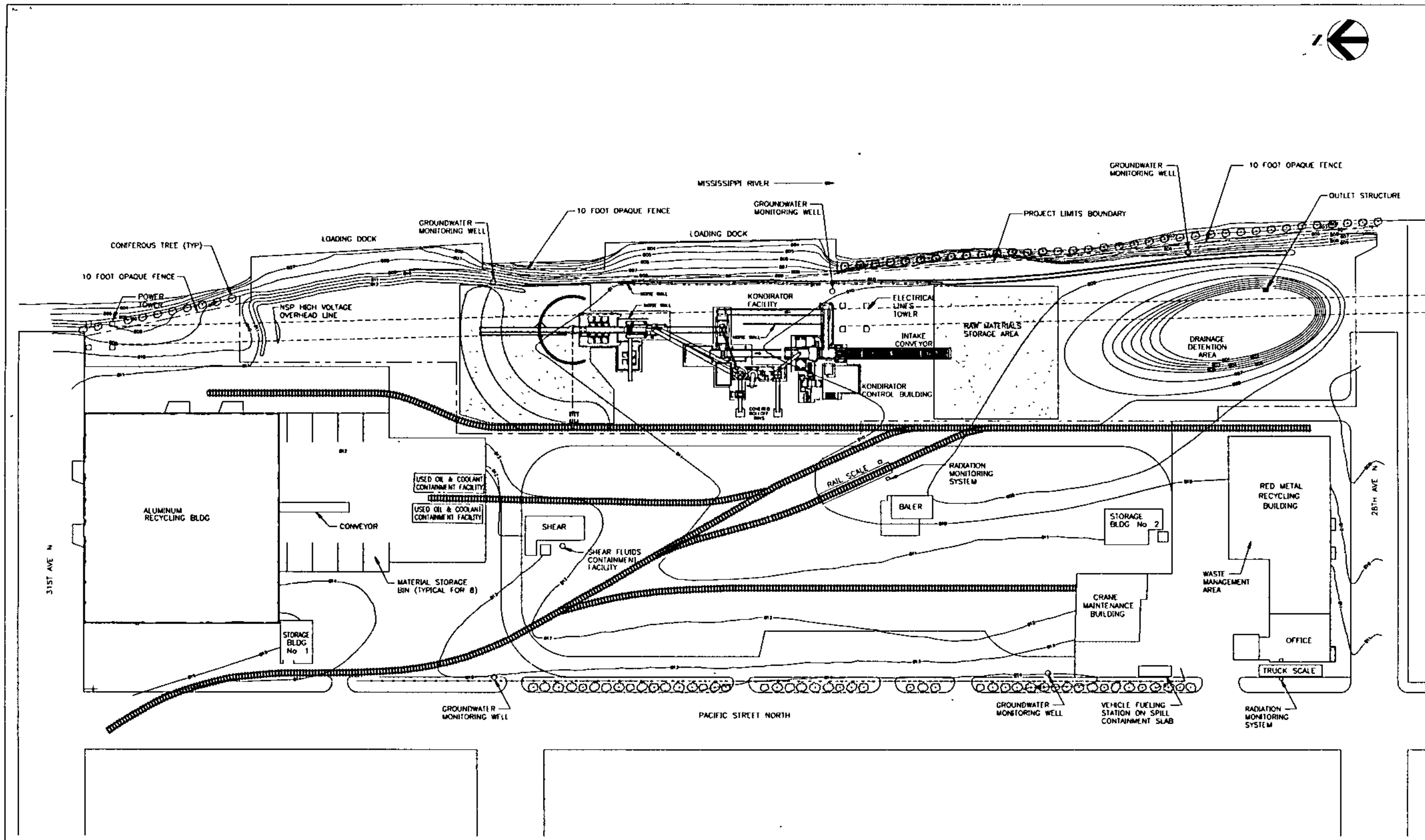
1967
REVISED 1993
DMA 7374 III SE—SERIES V872

IA 22092 Revisions shown in purple and woodland compiled in cooperation with State of Minnesota agencies from aerial photographs taken 1991 and other sources
Contours not revised. This information not field checked
Map edited 1993
Purple tint indicates extension of urban areas

EXHIBIT 5B

USGS TOPOGRAPHY

Figure 3



LEGEND

- DRAINAGE CONTOURS
- RAILROAD
- LOADING DOCK
- NSP POWER LINE
- BITUMINOUS PAVEMENT
- PROPOSED PAVED SURFACE

NOTE

1 FACILITY FDNS TOC = 81-6"

REFERENCE DRAWINGS

NSP TOWER DESIGN PIONEER
NSP LINE PLAN & PROFILE NH28603-4

SURVEYED

ADVANCE SURVEYING & ENGINEERING CO
MINNETONKA, MN 55345 (JUNE 29, 1990)

HDR

HDR Engineering, Inc.

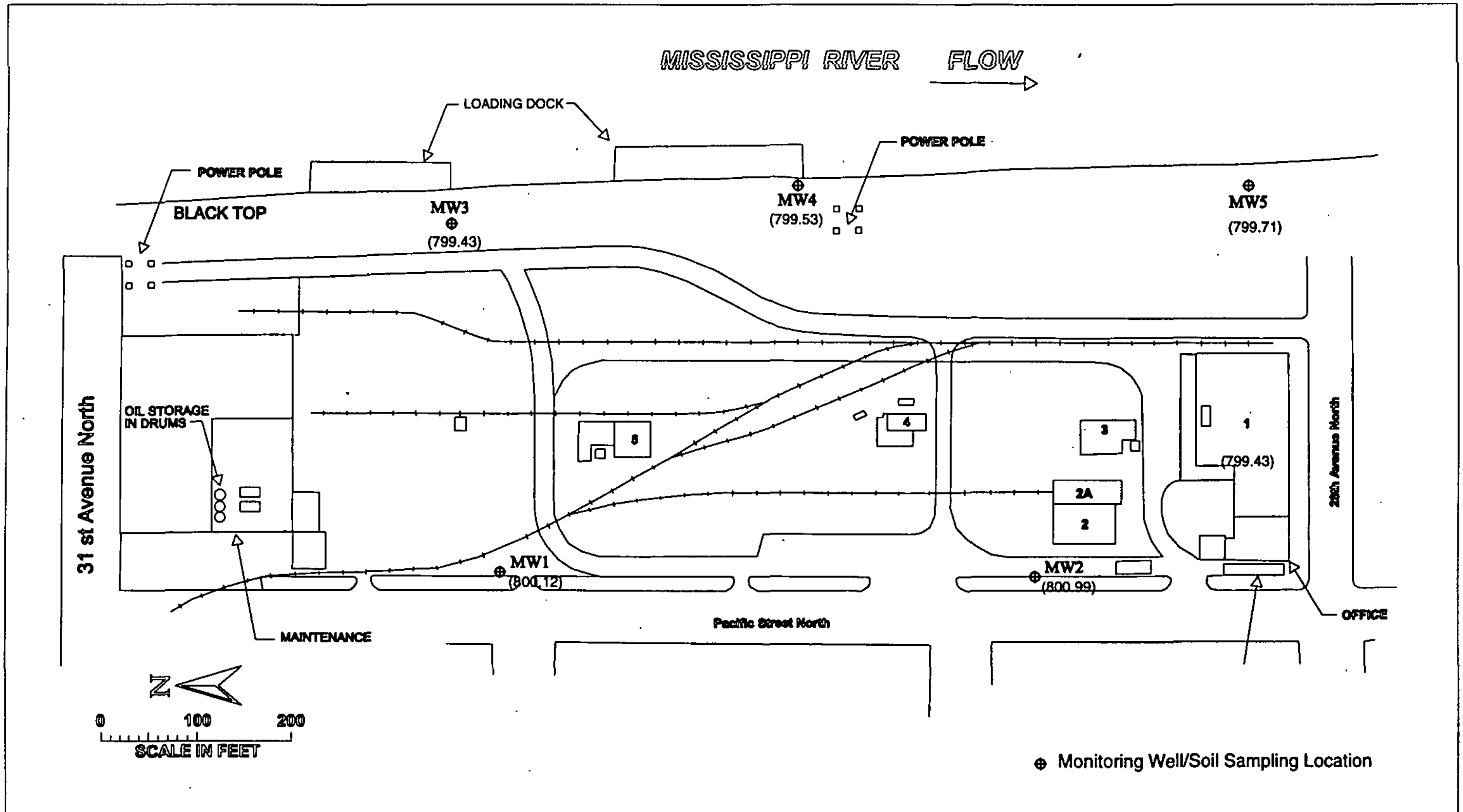
AMERICAN IRON & SUPPLY CO.
KONDIRATOR FACILITY LAYOUT

Date 9/1/95

Figure PR-8

FIN-PR8.DWG
P:\06828002
10/3/95

Figure 4



LEGEND

1 Offices and Red Metal Recycling Building
2 Crane Maintenance and Fabrication Shop
2A Crane Maintenance
3 Storage Buliding #2
4 Baler
5 Shear
6 Aluminum Recycling Building

American Iron and Supply

KONDIRATOR INSTALLATION

Environmental Assessment Worksheet

Monitoring Well/Soil Sampling Locations (October 1993)

Figure 5

KONDIRATOR PROCESS FLOW DIAGRAM
AMERICAN IRON & SUPPLY

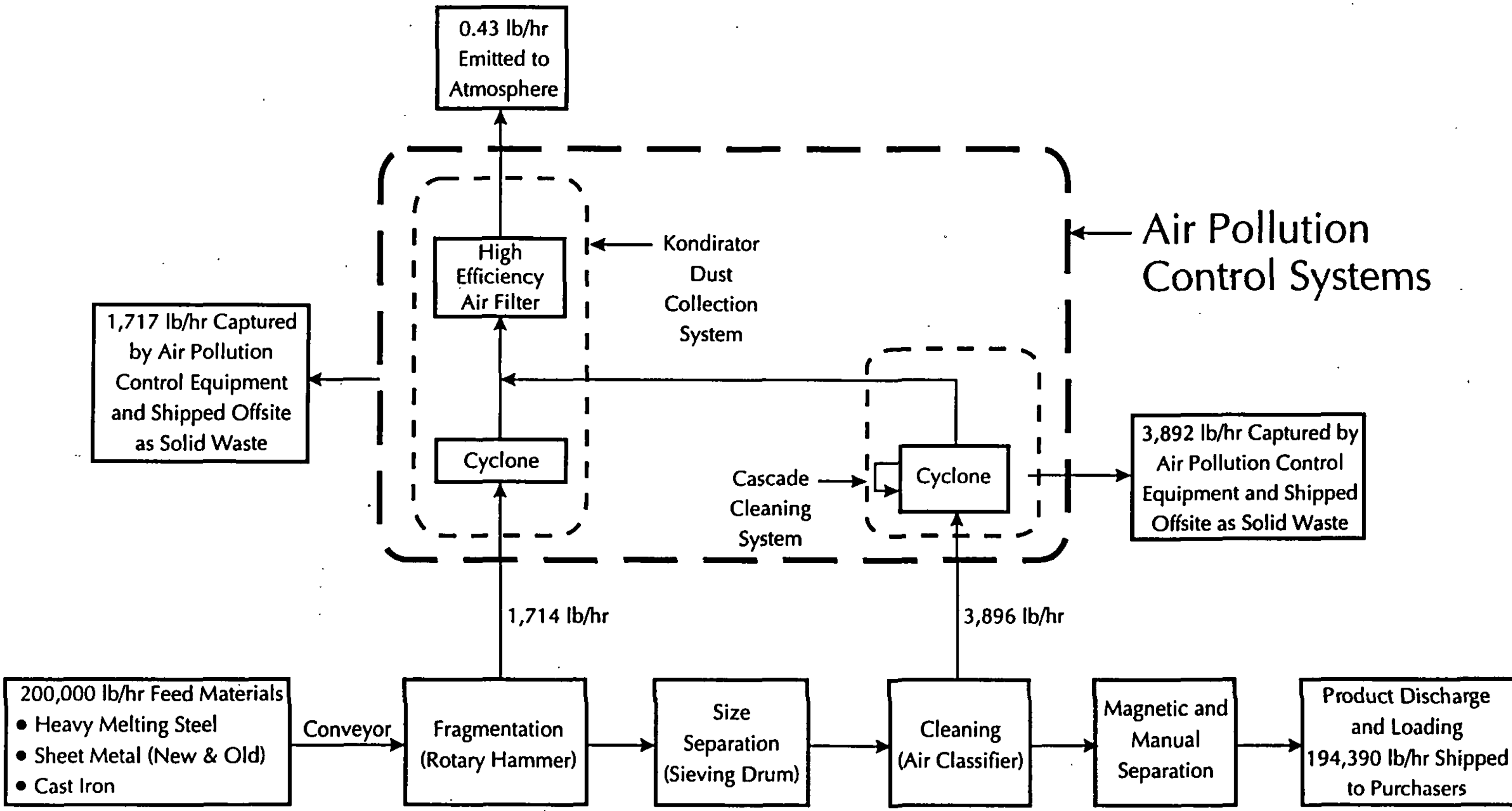
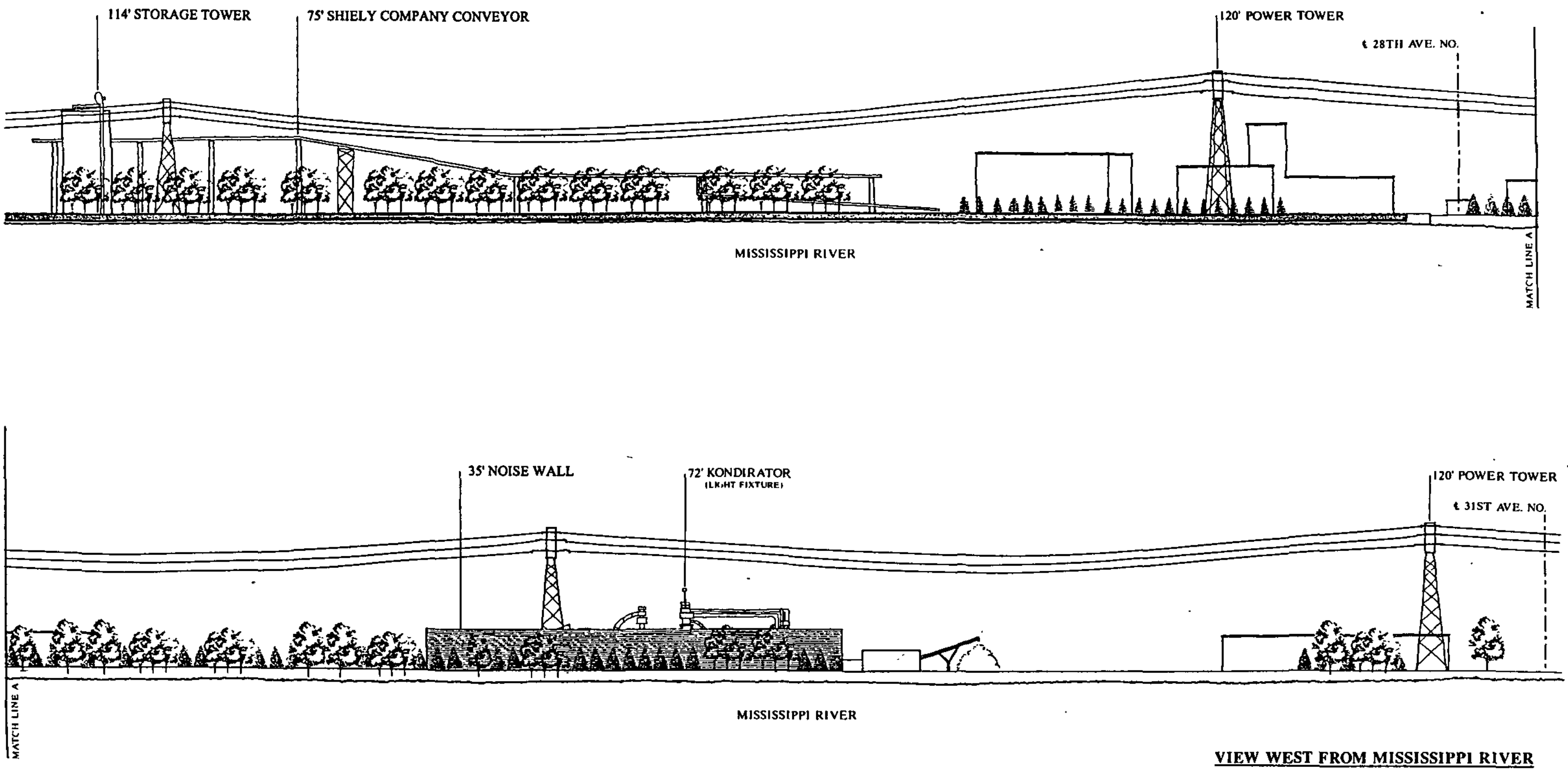


Figure 6

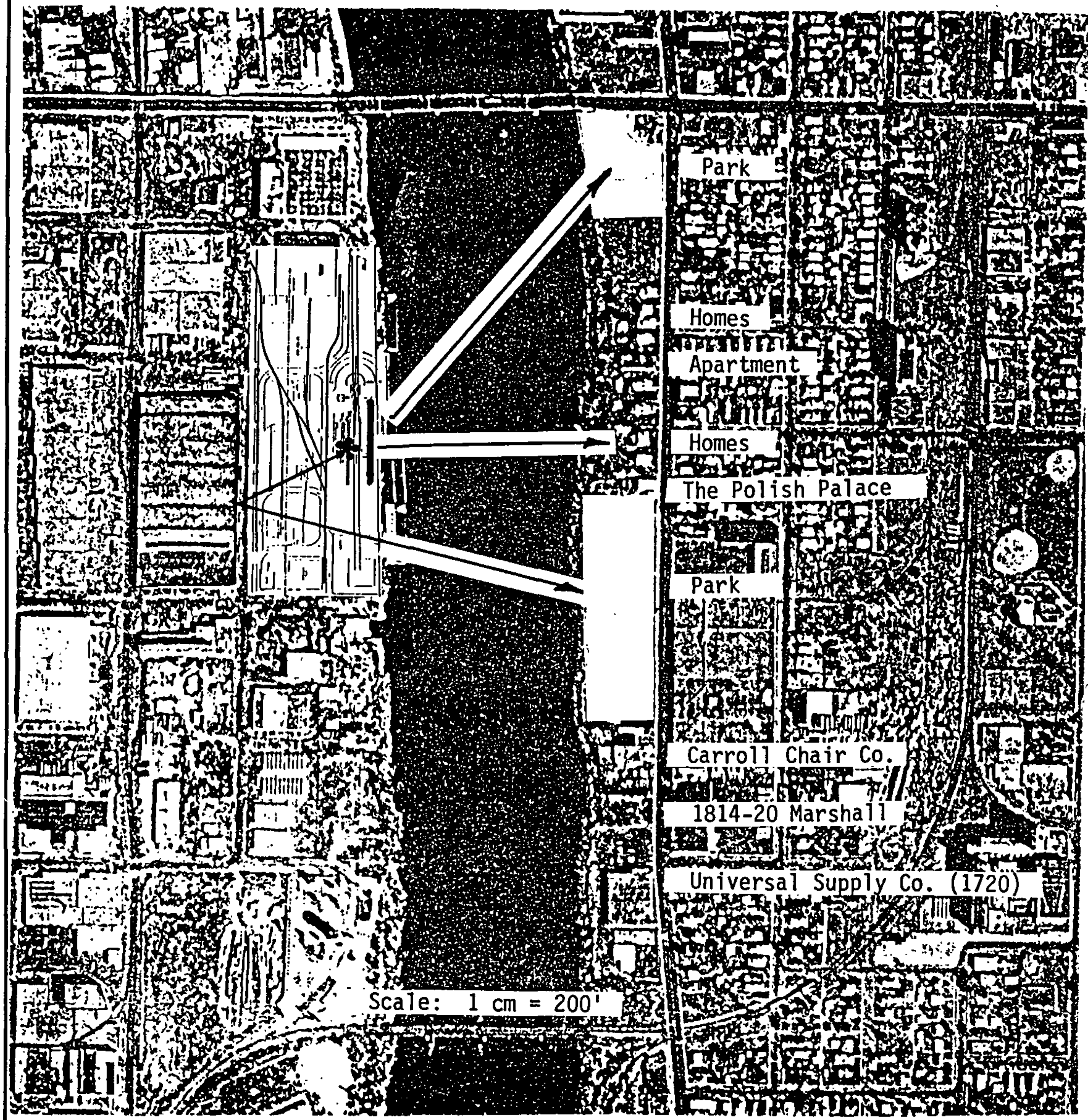


VIEW WEST FROM MISSISSIPPI RIVER

KONDIRATOR FACILITY

DAHLGREN SHARDLOW AND UBAN

Figure 7



American Iron and Supply **KONDIRATOR INSTALLATION** Environmental Assessment	EXHIBIT 25P Sensitive Land Uses (American Iron Site)